



Exploring Bioscience & Islam

**A Curriculum on
Fundamental Questions
about the Human Being**

Teacher's Companion

How to Use the Exploring Bioscience & Islam Curriculum

Introduction:

The Exploring Bioscience and Islam Curriculum is designed to build conceptual literacy at the intersection of bioscience and theology among Muslim students and cultivate confidence in using Wahy (revelation) as a genuine source of knowledge.

- Through this curriculum, students will:

Obtain an understanding that knowledge, both religious and scientific, is not always conclusive; rather, it must be evaluated in terms of the evidence sources and the relative certainty that can be attached to it.

Gain familiarity with epistemology; i.e., there are revelatory, rational, and empirical sources of knowledge, and claims from each domain may overlap, complement, or even conflict with each other.

Recognize that the source of all knowledge is Allah (SWT), and as such certainly true religious and scientific knowledge cannot conflict in reality. However, humans are limited beings; our understandings and interpretations are partial views of an ultimate reality.

This curriculum is geared towards Muslim students in high school, college, and medical school-type settings and their instructors/teachers.

- This curriculum addresses five fundamental questions about related to human being:

1. What is the origin of humankind?
2. What is the human's essential nature?
3. What is the human's future?
4. Are human actions predetermined?
5. Are humans unique in the universe?

Getting Started:

- Scan the QR code to go to the curriculum website
- On this website, you will find the following materials:
 - Unit Lesson Plans
 - Incorporated Activities
 - Presentation Slides
 - Lecture Videos
 - Supplemental Materials
 - Assessments
 - Question Banks
- To access the contents, you will need to provide your name, email, and affiliated school/organization. [All materials are free to use for educational purposes only.]



Exploring Bioscience and Islam Curriculum Overview:

- This curriculum comprises six thematic units and an additional application session to address the five fundamental questions. Each unit is divided into a few lessons, and each lesson is designed to take approximately 45-50 minutes of class time. Some lessons may take longer, depending on the students' level of understanding and if supplemental materials are utilized. Classroom activities are also sewn into the lessons along with associated instructions on how to conduct the activity. These can be adapted to meet the needs of the students in the classroom.
- Total Instructional Time - an average of 23 class periods or about 20 hours
- Units of Instruction: TOPICS AND TIMELINES (Scope and Sequence)
 - Unit 1 - What Do We Know and How Do We Know It? Reasoning Exercises in Islam and Science. [3-5 Class Periods]
 - Lesson 1: Intro to Epistemology and Islamic Epistemologies
 - Lesson 2: The Spectrum of Certainty and Judgment Types
 - Lesson 3: Overlapping Naturalistic and Islamic Epistemologies

Unit 2 - What is the Origin of Mankind? Evolution and God's Special Creation. [3-5 Class Periods]

- Lesson 1: Islamic Narrative of Creation
- Lesson 2: Part 1 - The Science of Evolution - Key Principles
- Lesson 2: Part 2 - The Science of Evolution - Evidence and Acceptance

Unit 3 - What Does it Mean to be a Human Being? Neuroscience, Artificial Intelligence and the Soul [3-5 Class Periods]

- Lesson 1: Part 1 - Islamic Concept of the Soul and Neuroscientific Reductionism
- Lesson 1: Part 2 - Physicalism, Modern Science, and Consciousness

Unit 4 - Human Enhancement and Transhumanism: Are We Changing the Human Being and Should We Change Our Being? [3-5 Class Periods]

- Lesson 1: Transhumanism - Biomedical Intervention and Biomedical Futures
- Lesson 2: Enhancement vs Treatment
- Lesson 3: Revelatory Insight into Enhancing Our Beings and Human Features

Unit 5 - Are We Programmed or Do We Have Free Will? Discussions on Fate and Genetic Determinism [3-4 Class Periods]

- Lesson 1: Islamic View on Free Will & Determinism
- Lesson 2: What Does Science Tell Us About Free Will & Determinism

Unit 6 - Are Human Beings Unique in this Universe? Science and Theological Inquiry about Extraterrestrial Life [3-4 Class Periods]

- Lesson 1: Do Extraterrestrial Beings Exist?
- Lesson 2: Human Exceptionalism and How Certain Is Extra-terrestrial Life

Epistemic Framework - Knowledge Café and Harvest: [1 Class Period]

- An Application Tool

Teaching

This Teacher's Companion is designed to be flexible and adaptable to meet the needs of a variety of teaching and learning environments. Here are the multiple ways in which this curriculum can be delivered, depending on the context and the capacity of the educators involved:

- The lessons are written as ready-to-use scripts that teachers can follow directly, ensuring consistency and ease of delivery.
- Teachers may choose to use the accompanying instructional (lecture) videos as the primary teaching tool while facilitating classroom discussions and checking for student understanding throughout each lesson.
- Schools or organizations may invite our team of experts to deliver the content through intensive mini-series or seminar-style workshops, with the support and collaboration of local teachers.

These options allow for a tailored experience that aligns with instructional needs and goals and utilizes the available resources of each educational setting.

Teaching Strategies:

- Assess your students' needs. Understanding what your students need to be successful in class can help you plan more effective lessons. Use the results from closure activities to determine whether you can move forward or need to spend more time teaching certain content to your students.
- Keep a log. Try keeping a log of each day's plans and explain whether the plan was effective. You can write what went well and what did not, so you know how to improve that lesson in the future. You can also use it to learn what strategies have helped your students so that you can plan similar approaches.
- Practice previously taught materials. You can strengthen students' knowledge by reviewing past contents in your plans. You can begin some lessons with worksheets on past skills to let them review and master previously learned materials before moving on to more complex skills.
- Plan ahead for differentiation. Since students have varying ability levels and intellectual capacities, differentiating instructions to meet the needs of diverse learners is crucial in attaining student understanding. Engage students and promote active participation to improve student growth and achievement continually.

Support Resources:

- Additional supplemental materials and resources are included to complement the curriculum and support the teacher in their instruction. These materials can be used as needed by teachers to educate and prepare themselves before teaching the content, as well as supplemental materials to enhance student understanding.
- Professional Development Workshops through the Initiative on Islam and Medicine (contact@medicineandislam.org) are also offered to train teachers to implement the curriculum in their schools or educational environments effectively.
- Engagement with this teaching module can work in the following ways: self-directed study (for individual educators), online teacher training, in-person training, or curricular implementation.

Lesson Outline

Educators are advised to read through each lesson plan completely so that they can better visualize each step of the lesson. This will then aid in preparing the appropriate materials, focus on activities that can be incorporated from other disciplines to engage students in the learning process, and adjust the lesson to meet the needs of the students.

How each lesson is outlined:

Unit #: Unit Topic

This is the main concept under which the series of lessons fall under.

(NOTE: The corresponding videos and some of the alternative materials will be labeled as “Seminar 1” which is the same as Unit 1, Seminar 2 is the same as Unit 2 etc.)

Lesson # - A focused discussion on a particular aspect of the topic of the Unit.

Time Length: Forty-five to fifty minutes is the approximate time that it would take in the classroom to complete this lesson; this time allotment does *not* include the use of the extra resource materials. This is located to the right of the unit lessons

INSTRUCTIONAL OUTCOMES - Outlines the learning standards that apply to this lesson. Both Next Generation Science Standards and Common Core State Standards are addressed.

NGSS (Next Generation Science Standards)
Common Core State Standards (CCSS)

Content Learning Outcomes: Defines what students are going to learn during the lesson and what they should achieve. achieve at the end of the lesson. Teachers can more effectively teach with an understanding of a clear objective. Students can learn their overall goal at the start of the lesson so they know what to focus on and how the content applies to them.

Materials: The specialized materials the teacher and the students might need during the lesson are listed here, along with resource materials connected to the lesson. The point at which these materials can be utilized is mentioned in the lesson itself.

- Every lesson has Presentation Slides linked (QR can be found on the Unit Contents page)

- The videos that will be used in the lesson
- Resource and supplemental materials that would be helpful for the teacher, which can also be shared with the students as needed.
- Assessment Questions that can be used for this lesson to assess student learning and comprehension
- Materials and equipment such as pen, paper, screen to project the slides, internet, an app for viewing YouTube videos, etc are not listed and are left at the discretion of the teacher.

Instruction/Teacher Facilitation: This portion of the lesson is the direct instruction of the learning content and skills.

{SLIDE #} - indicates the corresponding slide for the teacher to present as this content is being taught.

Some words have been highlighted in the first lessons to instruct students to add them to their triple-entry vocabulary journal.

Classroom Activities are also sewn into the lesson along with associated instructions on how to conduct the activity. These can be adapted to meet the needs of the students in the classroom.

Biology Connection and Islamic Studies Connection:

In this section, there is a suggestion to make this lesson interdisciplinary by connecting to a specific topic in a Biology lesson or an Islamic studies lesson.

Assessments:

The assessment documents for each lesson follow any additional resource or supplemental materials. A student's edition (or blank assessment) is included along with the teacher's edition (with answers) which can be used at the teacher's discretion; as homework, as formal assessments like quizzes or exams, or during instruction to check student comprehension. This document is essentially a bank of a variety of question types that can be utilized and adjusted as needed; as homework, as formal assessments like quizzes or exams, or during instruction to check student comprehension. This document is essentially a bank of questions that can be utilized and adjusted as needed.

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Curriculum Contributors



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Dr. Padela is Professor of Emergency Medicine, Bioethics and the Medical Humanities at the Medical College of Wisconsin, and director of a non-profit organization, The Initiative on Islam and Medicine. He holds an MD from Weill Cornell Medical College and a MSc in Healthcare Research from the University of Michigan. He completed emergency medicine training at the University of Rochester and a clinical ethics fellowship at the University of Chicago and visiting fellowships at the Oxford Centre for Islamic Studies and the International Institute for Islamic Thought. He has authored over 150 peer-reviewed articles and book chapters and one monograph, 'Maqasid al-Shari'ah and Biomedicine: Bridging Moral, Ethical and Policy Discourses' (IIIT Press 2024). He is also editor/co-editor of four books: 'Medicine and Shari'ah: A Dialogue in Islamic Bioethics' (UND Press 2021), 'Islam and Biomedicine' (Springer 2022), 'Organ Donation in Islam: The Interplay of Jurisprudence, Ethics and Society' (Lexington Books 2022) and 'Islam, Muslims, and COVID-19: The Intersection of Ethics, Health, and Social Life in the Diaspora' (Brill 2024).



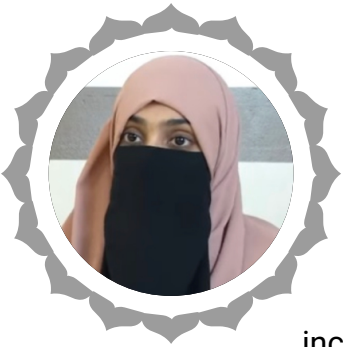
Abdurezak Hashi (PhD)

Prof. Abdurezak Hashi obtained his bachelor's degree, his master's degree, and his PhD from the International Islamic University Malaysia (IIUM) in Theology and Comparative Religion. He joined the Kulliyah of Science at IIUM as an Assistant Professor in 2008. In 2014, he was awarded the Best Teacher award and appointed as the editor of the Kulliyah of Science academic journal, Revelation and Science. Currently, Dr Hashi is a Professor at the Department of Biotechnology and the coordinator for the Multi-disciplinary Academic Postgraduate Programme.



Ahsan M. Arozullah (MD, MPH)

Dr. Ahsan M. Arozullah is a physician and pharmaceutical executive with over 20 years of clinical research experience in the pharmaceutical industry and academic settings. He graduated from Northwestern University Medical School and currently leads a global team of medical directors who provide world-class medical leadership to clinical development teams dedicated to creating the next generation of targeted oncology therapies. Dr. Arozullah collaborates with top scientists, clinicians, and caretakers from around the world to develop novel therapies and to study these therapies in patient-centric ways to bring the highest life-changing value to patients. He is also a member of the Board of Directors at Darul Qasim College, an Islamic institute that aims to make Islamic knowledge a contributor to the mainstream American academic narrative.



Aisha Basith

Aisha Basith is a seasoned educator who has been teaching since 2004. She holds a Bachelor's degree in Education and Biology, with a Middle School Endorsement, from the University of Illinois. Mrs. Basith has taught grades 5-12, focusing primarily on the sciences, including Honors and AP Biology. She has extensive teaching experience in public and Islamic schools, as well as in homeschooling, and has also held an administrative role for three years. Furthermore, Mrs. Basith has studied in Aalimiyya programs, gaining knowledge of the Islamic Sciences under traditional scholars, and currently conducts Tajweed/ Quran, Arabic, and Tafsīr classes. Additionally, she serves as a consultant for High Quality Educational Consulting (HQEC).



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Habeeb Quadri (MA)

Habeeb Quadri is an Educator, Author, and Youth Activist. He has a Bachelor’s in Teaching of History and a Master’s in School Administration. He is an Elementary School Principal and part-time staff at Harvard Graduate School of Education professional development programs.

Habeeb has served a four-year term at the Harvard Graduate School of Education Principal Advisory Board. Habeeb is the board chair of MYNA (Muslim Youth of North America) and board member of CISNA (Council of Islamic School of North America). He has lectured throughout the United States, Canada, and abroad on Islam, society, and social problems confronting Muslim youth and the community at large. Habeeb Quadri has his own educational consulting company called High Quality Educational Consulting, and he has co-authored ‘War within Our Hearts (The Struggles of the Muslim Youth)’, ‘Thank God it is Jum’ah’, ‘Parenting, Who Said it Was Easy’, ‘Wisdom of the Wise: Advice of Luqman,’ ‘The Islamic School Resource Guide: Developing Schools and Educational Excellence,’ and was the religious and cultural consultant for the children book ‘Under the Ramadan Moon’ by Sylvia Whitman. In 2019, he became the first Muslim Principal to be named National Distinguished Principal by the National Association of Elementary School Principals (NAESP).



Hamza Karamali (MA Sc)

Shaykh Hamza Karamali teaches parents, teachers, and scholars how to protect Muslim children from losing their dīn. He has a Bachelor’s and Master’s in Computer

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Macksood Aftab (DO, MSc)

Dr. Aftab is Chairman of Radiology at Ascension Genesys Hospital. He is actively involved in teaching and is a clinical assistant professor at Michigan State University, Central Michigan University, and AT Still University. He completed his Neuroradiology fellowship at the Harvard Medical School and holds a Master's degree in History of Science from the Harvard Extension School. His thesis title was 'Historicizing Ghazali's Critique of Ibn Sina and Its Influence on Islamic Science.' His research interests span across philosophy, theology, and neuroscience.



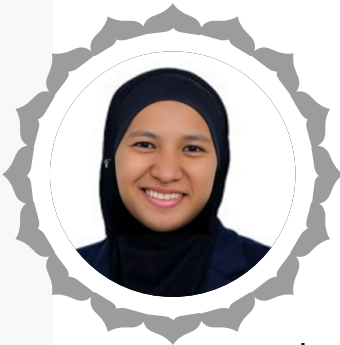
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Omar Qureshi (M.Ed, PhD)

Dr. Omar Qureshi is the Director of Integrated Curriculum at Yaqeen Institute in the United States. He previously taught Western and Islamic Philosophy and was the head of the Diploma in Contextual Islamic Studies & Leadership (CISLD) at Cambridge Muslim College. Dr. Qureshi earned his Bachelor of Arts in Microbiology and subsequently completed his M.Ed. in Curriculum and Instruction – Science Education, both from the University of Missouri – Columbia. Later, he earned his Ph.D. in Cultural and Educational Policy Studies with a specialization in the Philosophy of Education from Loyola University Chicago in 2016. His dissertation, titled ‘Badr al-Dīn Ibn Jamā’ah and the Highest Good of Islamic Education,’ explores the topic of educational institutional identity in the United States. Before joining Cambridge Muslim College, he served as the provost and assistant professor of Liberal and Islamic Studies at Zaytuna College. Dr Qureshi also held the positions of principal and dean of academics at a parochial school located in the western suburbs of Chicago for seven years.



Raudah M. Yunus (MBBCH, MPH, DrPH)

Dr. Raudah Yunus is a researcher, writer, and public health specialist. She is currently pursuing a postdoctoral fellowship at the Medical College of Wisconsin. Dr. Yunus spent her medical school years in Alexandria, Egypt where she also learnt Arabic language and literature. Subsequently, she completed a Master of Public Health (MPH) and a Doctor of Public Health (DrPH) at the University of Malaya in 2015 and 2018, respectively. Dr. Yunus has taught at the Faculty of Medicine (UiTM, Malaysia) since 2015 and her research interests include elder abuse, long-term care, health disparities, refugee and migrant health, and Islamic bioethics.



Shaza Khan (PhD)

Dr. Shaza Khan is the Executive Director of the Islamic Schools League of America (ISLA), a nonprofit that supports full-time Islamic schools in the United States by providing professional development, networking, information, and resources, and engaging in critical research on Islamic education.

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Shoaib A. Malik (MSc, PhD, PhD)

Dr. Shoaib Ahmed Malik serves as a Lecturer in Science and Religion at the School of Divinity under the auspices of the University of Edinburgh. A standout alumnus of the University of Bath, Dr. Malik excelled as the top graduate in BEng of Chemical Engineering.

He later became one of the first Muslim students to embark on an MSc in Philosophy, Science, and Religion at the University of Edinburgh. With two PhDs in Chemical Engineering and Theology from the University of Nottingham and St Mary's University, respectively, Dr. Malik is further enriching his Islamic studies under the guidance of Sh. Ali Laraki, among other scholars. In addition to being a Senior Fellow of Advance HE and Fellow of the International Society for Science and Religion (ISSR), he is the Chief Editor for Palgrave Macmillan's groundbreaking monograph series and encyclopedia on Islam and Science. He is currently devoted to producing scholarly articles, book chapters, and volumes exploring the nuanced relationship between Islam and Science.

UNIT 1:

What Do We Know & How Do We Know It?

Reasoning Exercises in Islam & Science

Lessons

Lesson 1: Introduction to Epistemology
and Islamic Epistemology

Lesson 2: The Spectrum of
Certainty and Judgment Types

Lesson 3: Overlapping Naturalistic
and Islamic Epistemologies

Unit 1: What Do We Know and How Do We Know It? Reasoning Exercises in Islam and Science

- Unit 1 Presentation Slide Deck (Scan QR code below to view)
- Lecture Video (Seminar 1) (Scan QR code below to view)

† Lesson 1: Intro to Epistemology and Islamic Epistemologies

- Supplemental Material - Triple-Entry Journal Instructions
- Activity - Sources of Knowledge Graphic Organizer
- Assessment (Student's Edition & Teacher's Edition)

† Lesson 2: The Spectrum of Certainty and Judgment Types

- Supplemental Material - Spectrum of Certainty
- Worksheet - Judgment/Propositions
- Supplemental Material - God's Existence
- Supplemental Material - Proofs of Prophethood
- Assessment (Student's Edition & Teacher's Edition)

† Lesson 3: Overlapping Naturalistic and Islamic Epistemologies

- Assessment - (Student's Edition & Teacher's Edition)



Introduction to Epistemology and Islamic Epistemology

REASONING EXERCISES IN RELIGION & SCIENCE

How Do We Apply Human Reasoning?
(Sources of Knowledge and the Spectrum of Certainty)

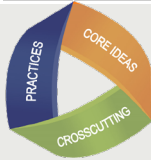
Unit: 1

Lesson: 1

Time

Length:

45–50 min



NGSS Instructional Outcomes

Next Generation Science Standards

Science and Engineering Practices:

- † Asking Questions and Defining Problems: Students are encouraged to ask questions about the nature of scientific thought and religious thought.
- † Engaging in Argument from Evidence: The examination of propositions (rational, revelatory, empirical) and their justifications fit is this practice.

Crosscutting Concepts:

- † Cause and Effect: Understanding the relationship between different types of knowledge and how they influence beliefs and understanding.
- † Systems and System Models: Exploring how different systems of thought (scientific and religious) interpret and understand the world.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards Science & Technical Subjects, Grades 6-12:

CCSS.ELA-Literacy.RST.6-8.1 & 9-10.1: Cite specific textual evidence to support analysis of science and technical texts.

CCSS.ELA-Literacy.RST.6-8.8 & 9-10.8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

Mathematics Standards (for critical thinking and logical reasoning aspects):

CCSS.Math. Practice MPI: Make sense of problems and persevere in solving them.

CCSS.Math.Practice.MP3: Construct viable arguments and critique the reasoning of others.

English Language Arts Standards for Speaking and Listening:

CCSS.ELA-Literacy.SL.9-10.1 & 11-12.1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 9-12 topics and texts.

Content Learning Outcomes:

1. Identify and explain the sources of knowledge and their relationship to each other.
2. Define, provide examples, and explain the relationship between the three types of propositions (rational, revelatory, empirical).
3. Classify various propositions and provide justification.
4. Demonstrate the position of scientific propositions in the Islamic epistemological framework.

Materials:

- † Presentation Slides: Slides 1–19
- † Triple-Entry Vocabulary Journal Instructions
- † Triple-Entry Journal Template
- † Youtube video *Galileo Galilei in a Nutshell*
- † Sources of Knowledge Graphic Organizer (page 25)
- † Unit I: Lesson I Assessment

Instruction/Teacher Facilitation:

SLIDE 4: Scenario

† *SCENARIO: Share the scenario of a particular medical doctor describing his approach to the relationship between his scientific work and his religion:* A medical doctor says that the way he lives as a Muslim research scientist is that he wakes up as a Muslim and does everything as a Muslim, praying, eating, dressing etc., but when he gets to work, puts on his lab coat, and enters his lab, he says, “I leave my Islam at the door.” When I am done doing my research for the day, and exit my lab and take off my lab coat, I am a Muslim again and continue my day as a Muslim would.

- There are many people of faith, Christians, Jews, and others, who do the same, leave their religion at the door. They also seem to have this same approach towards religion and science.
- Q: What do you think about this scenario? Is this really the approach we should be taking as Muslims, leaving our Islam at the door when it comes to science and scientific endeavors? [Students can discuss whether or not they agree with this approach.]
- *A: The answer is obviously that this is not the right approach, as you will see through this unit is study. God exists outside the lab, but also inside the lab. God created what they are researching, the tools they are using to research, and even created the researcher himself. There is no way to isolate God from the realm of science. This is why it is important to have the proper understanding of epistemology and how empirical and rational propositions correlate.*
- Introduce the topic by asking the students how they would define “Scientific Thought” and how they would, in turn, define “Religious Thought.” Usually science is defined to be “rational” thought and discusses logical thinking skills and processes, and the scientific method. In contrast, religious aspects are separated from the realm of science and considered “supernatural.”

SLIDE 5:

This is the misconception in our minds, usually taught to us by society or secular schooling. In reality, Islam encourages rational thought, therefore in the Islamic worldview, religion and science are not separate, but have much overlap. Historically, many theologians were scientists.

† Q₁: Regardless of whether science does or does not work well with religion, do we believe science to be neutral? • Q₂: Is science simply describing and reporting the observable/what we experience in the world, OR does it have its own philosophical/metaphysical commitments? • *[Give students an opportunity to answer these questions.]*

■ *A¹: Science is not neutral, it has its own understanding of reality.*

■ *A²: When scientists study and report, they come with their own beliefs and values, and commitments. Those beliefs and commitments influence the scientists' interpretation of their findings. How things are interpreted is dependent on these influences.*

■ This is an important aspect to consider and keep in mind when going through this Unit

† Looking at religion and science, the main aspect of religion is belief in God.

■ According to the famous scientist and a main contributor to the New Atheist movement/belief, Richard Dawkins, the question "Does God exist?" is a scientific question. Science should be able to answer this question.

■ Q: Do you believe it is a scientific question?

■ *• A: It cannot be a scientific question because science is the study of natural phenomenon of time and space/place. So if we say that this question is a scientific hypothesis, then we are inferring that God must be within space and time. And as Muslims, this goes directly against our theology/aqīda. We know that Allah SWT as mentioned in the Qur'an, transcends space and time. This is the limit of science, it can only study natural phenomena within space and time. Science can only study certain aspects of reality, not all aspects of reality.*

■ Science is not just about learning facts, there are a lot of assumptions made in the field of science and in the process of inquiry, particularly biological sciences, and in order to understand the study of science, this needs to be made clear.

SLIDE 6:

† How do we apply human reason?

■ In Islam, we are encouraged to ask questions, with the right intentions. [Intent to learn, to benefit from this newly gained knowledge, intent to understand so as to increase our *yaqīn*, resulting in increased obedience to Allah SWT.]



- The Qur'an also asks questions to us as humans, for us to question our own intentions and purposes, and to make us think deeply.

ع E.g., in the Qur'an, Allah SWT asks us in Surāh At-Takwīr, 81:26: فَأَيْنَ تَذْهَبُونَ So where are you going?

- So what questions are we asking??

† People of the past did ask questions, and they looked for answers; but not without conflict and clashes with religious thought.

SLIDE 7:

† **Galileo Science and the Church -**

† Scan QR Code to watch the video

† Watch this video [2:45 min.]

SLIDE 8:

After viewing, ask students comprehension questions and critical thinking questions:

- † Q: What was Galileo's point? What was he saying?
 - *A: We should observe physics in the world through scientific methods, observe, hypothesize, test/experiment. Galileo discussed these three concepts: acceleration, that objects fall at the same rate regardless of size/weight, and argued for heliocentrism (the sun is the center of the universe and the earth rotates around it). Important to note here is that scientific findings can change with further discoveries and reinterpretation.*
- † Q: What was the Church saying? What was their response to Galileo?
 - *A: The Church felt that his findings contradicted their doctrine, e.g., Geocentrism: the earth is the center of the universe. Feeling challenged, the church put Galileo under house arrest. This set the precedent for conflict between science and religion.*
- † Q: What does it mean for religion and science to conflict?
 - *A: People say not to bring religion into science because there is this history of conflict and the expectation of conflict, inevitably. It confuses people because science tells you something and religion tells us something else, specifically for the Christian world. Many Muslims have absorbed such feelings as well and see this conflict evident in popular media. So, just like the doctor who left his religion at the door, we have been trained to separate science and religion into different compartments. If we look at Islamic history, we will*

not find such a disconnect between religion and science, but now in modern times, we are somehow experiencing this conflict and confusion.

- † First things first, we have to correct our thinking, our process of thinking, and our predispositions of thought in general.

SLIDE 9:

In order to help us keep track of this new set of vocabulary that we will be learning, we will use a Triple-Entry Vocabulary Journal.

- † Introduce students to the Triple-Entry Journal (p. 31).
 - Model how to create the Triple-Entry Vocabulary Journal by displaying the Triple-Entry Journal template (which is included in the slide deck) or drawing three columns on the board and label as in the template distributed to students.
 - Stressing the importance of understanding the vocabulary associated with any topic to attain comprehensive and more complete understanding, and avoiding confusion.
 - The teacher should explicitly have students pause and add words to their journal throughout the lesson, specifically terms that students do not know or might not fully understand (other columns can be filled later if needed).
 - Students can also add words that are new to them or are difficult for them to comprehend or remember.
 - After formally instructing students to keep adding words to the journal, this task can be placed as the student's responsibility.

SLIDE 10:

- † Define Epistemology *[Instruct students to add this word to their vocabulary journal.]*
 - It is a branch of philosophy
 - **Episteme**- means 'knowledge or understanding,'
-ology means 'the study of'
 - Epistemology is the study of knowledge, how do we know things, what do we know, what can we know, and to what degree of certainty can we know it

SLIDE 11:

Judgments or Propositions (*ḥukm*) [Add to journal]

- † A proposition, or judgment, is a sentence/statement which can either be true or false.

- Examples: (Ask students to determine if each is a proposition or not.)

The sky is blue. • Yes, a proposition because you can observe it and verify it is truth or falsehood. Sky subject; blue predicate.

Zaid is not eating. • Yes, a proposition because you can see if he is eating or not and verify. Zaid subject; eating predicate

Stand up! • NOT a proposition, because you cannot ascertain it is truth or falsehood, it is a command.

- † A proposition, or judgment, has two essential parts: a subject and a predicate.

- In a proposition/judgment, you either affirm (*ithbāt*) or negate (*nafi*) the predicate of the subject, all knowledge is propositional knowledge.

- † Propositional knowledge is a concept found in Islamic theology as well.

SLIDE 12:

What is truth? We stated that only propositions, or judgments, can be true or false

- † Yet, the question remains: How do we know if a proposition is true or not?
- † For a proposition to be true, it must correspond to the object as it truly is.

- This is known as the correspondence theory of truth, which states that the truth or falsity of a statement is determined only by how it relates to the world and whether it accurately describes that world.

- In simple words, the correspondence theory says that truth is a connection to reality. To be true is to accurately describe, in other words, match, picture, depict, express, conform to, agree with, or correspond to the real world or parts of it.

SLIDE 13:

Muslim theologians state that humans have the following sources of knowledge:

- † The five senses
- † The intellect (*al-'aql*)
- † True reports (*al-khabar aḥ-ṣādiq*)

- † Intuition/Inspiration (*ilhām*)
- † **Thought Exercise:** *to demonstrate this understanding of the sources of knowledge, give the scenario of a person coming to visit your home and is present at the door:*
 - You hear a knock at the door (one of 5 senses)
 - You can use your intellect to understand that since you heard a knock, someone must be at the door. (intellect/aql)
 - Your sibling/member inside the house also heard the knock and told you that someone is at the door. (True report)
 - A few days earlier, you had an unexplicable 'feeling' that a person was going to come to visit you and that you should prepare to meet him in a specific manner. (*ilhām*)

Use this scenario and the examples to the sources of knowledge.

SLIDE 14:

- † The five senses – al-*ḥawāṣṣ* al-khams – are touch, sight, hearing, taste, and smell.
- † The five senses provide us with knowledge of physical objects
- † Touch is the first sense we develop as a fetus, then taste and smell around the same time, then hearing, and lastly sight. So these senses are our first means of exposure to the world.
- † This is called **empirical knowledge** - knowledge gained from the senses

SLIDE 15:

The Intellect – *Al-'Aql* – our reasoning and logical capacity (the science of logic is called *mantīq*).

- † First principles of rational/intellectual thought: (or Laws of Thought)
 - The principle of non-contradiction (PNC) states that contradictory propositions cannot both be true in the same sense, at the same time.
 - PNC is the most important, foundational principal. Islamic scholars say that this principle is the source of all rational thought. If we do not have this principle, we would not be able to define knowledge and communicate that clearly. (Remember this is regarding rational knowledge, not empirical knowledge.)
 - E.g., Two is an even number. Two is not an even number.
 - Both of these are propositions/judgments.
 - According to PNC, both statements cannot be true. Only one has to be true and the other has to be false.

SLIDE 16:

- † The principle of the excluded middle (PEM) states that a proposition can either be true or false, not both. There is no middle state between true and false.
 - E.g., Two is an even number.
 - According to PEM, this statement is either true or false. No middle category between true and false.
- † This is how intellectual thought is structured; the basis of all reasoning.

SLIDE 17:

- † True reports (*al-khabar aḥ-ṣādiq*) refer to knowledge gained based on the testimony of others.
- † Testimonial knowledge is dependent on the reliability of the person conveying the report or knowledge. Therefore, this is knowledge that must be vetted for truth.
- † Most of what we know falls under this category.
 - **Thought Exercise:** Q: Can you give me examples of knowledge we gain from true reports?
 - A: Textbook information is of this type because it is written through the author's interpretation and point of view
 - A: Data - the collection of data is empirical knowledge
 - A: The researcher's interpretation and written report (to share his findings) can be considered as a true report
 - A: Someone comes and tells you what he/she saw or heard.
 - A: News reports
 - A: Even google maps is based on reports

SLIDE 18:

Inspiration/Intuition (*Ilhām*) *[this is a very specified knowledge and can be very individualized; not for everyone]*

- † Something that a person knows that from Allah, revealed directly to his/her heart.
- † Dreams can be a form of ilhām. A very important form of knowledge. It is a sunnah to get dreams interpreted.
- † Allah SWT swears, ﴿... [by] the soul and He who proportioned it; And inspired it [with discernment of] it is wickedness and it is righteousness.﴾ (Surah Ash-Shams, 91: 7-8)

- † **Ilhām**/divine inspiration to Umar R: While delivering a sermon in Medina, Umar (R) suddenly paused and called out, “**Ya Sariya, al jabal!**” which translates to O Sariya, [watch] the mountain!” Sariya (R) was a companion who was the commander of the Muslim army engaged in a battle in a place called Nahawan. Sariya (R) and his troops heard Umar’s warning and changed their strategy accordingly, which helped them avoid an ambush and win the battle.
- † Also mentioned in the Qur’an, ﴿And your Lord inspired/revealed to the honey bee: Make homes in the mountains, in the trees and in the structures they raise.﴾
- † Frederick Kekule, the German chemist who discovered the chemical formula for benzene in 1865, claimed that he had a dream about the C_6H_6 ring formula with the alternating single and double bonds. Through this ilhām/intuition, he discovered the structure of benzene. So we see that ilhām has a role even in science. We need to develop this habit of thinking about what kind of knowledge it is and then, the next step is to verify it is truthfulness.

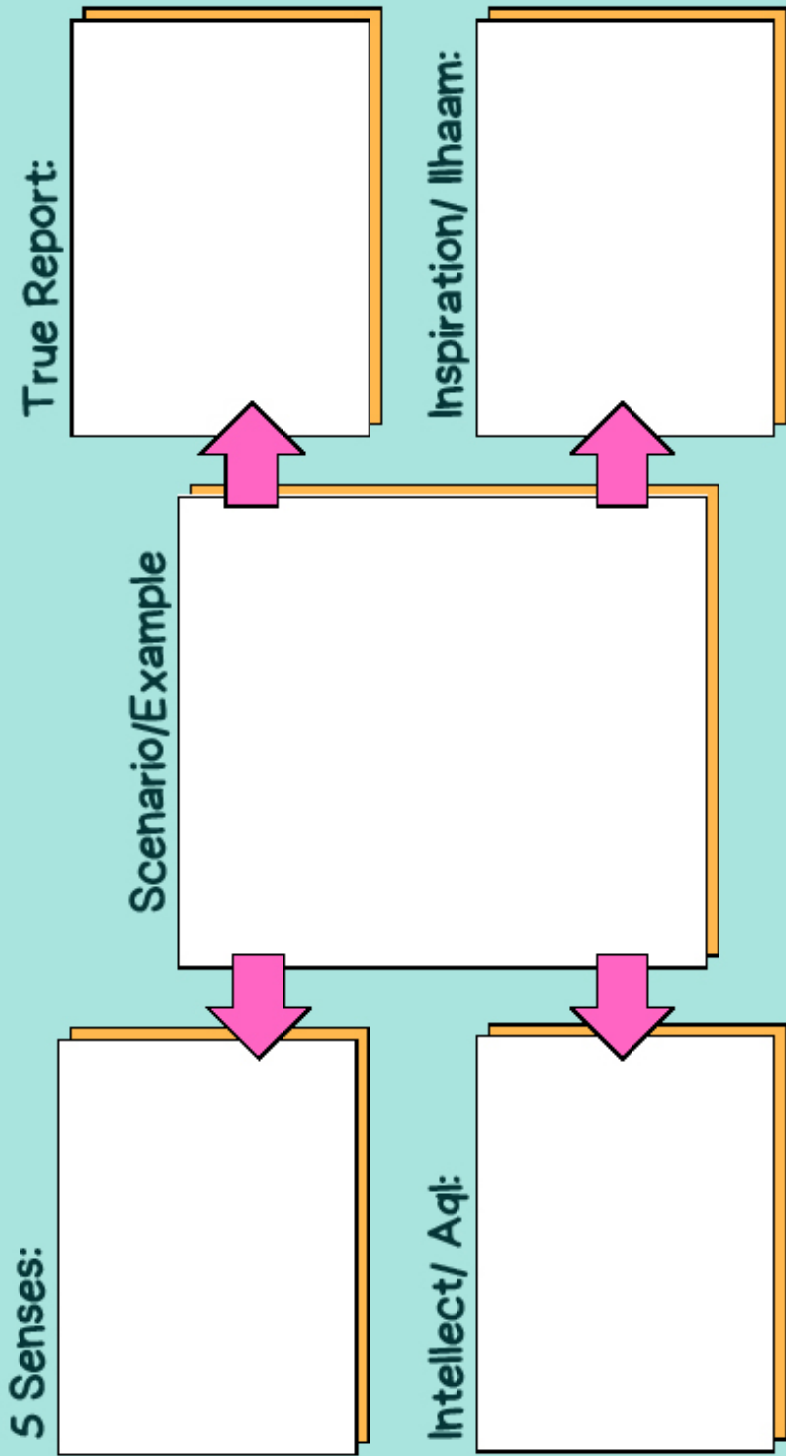
SLIDE 19:

Student Activity: instruct students to think of an example or a scenario that would incorporate all four sources of knowledge; similar to the example of the person knocking at the door. Have them fill out the **Sources of Knowledge Graphic Organizer**.

- † This can be used in the form of a Think/Pair/Share classroom activity or Group Activity.
- † It can also be used as an assignment to check for student understanding.
- † Students should then share examples/scenarios with the class.

Name: _____

Sources of Knowledge



Instructional Material: Triple-Entry Vocabulary Journal

5. Introduce the Triple-Entry Vocabulary Journal by giving students a template with the page split into three columns labeled:

a. Word in Context,

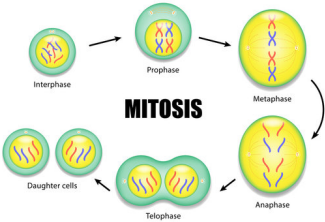
b. Definition in My Own Words, and

c. Picture/Memory Aid/Phrase.
6. Model how to create the Triple-Entry Vocabulary Journal by drawing three columns on the board and label as in the template distributed to students.

E.g., Look at the page in the chapter where mitosis is introduced. In the first column, jot down the page number and the sentence that has the term mitosis.
7. Read any surrounding sentences, picture captions, or diagram explanations to further understand the meaning of the word.
8. Explain what clues you see in the text explanation that help you write a definition of the term in your own words. Stress that “in my own words” means in words that you can understand; but, these words must be precise and accurate.
9. Jot down a phrase that helps you connect with the meaning of the word. Draw a picture that helps you recall the definition. Note any key information about the word that would be necessary in recalling or understanding the word accurately.

E.g., Analogous example, key differences in terms, draw a picture/diagram.

Sample of a Triple-Entry Vocabulary Journal Template:

Word in Context	Definition in My Own Words	Picture, Memory Aid, Phrase
Mitosis is the process in which a cell duplicates it is chromosomes to generate two identical cells. interphase prophase metaphase anaphase telophase cytokinesis	Mitosis happens when a cell divides perfectly to form two new cells that are exactly alike.	Connection: I think of bread dough rising, and one ball becomes two when I divide the ball of dough into two balls. 

10. After providing the template, stress to the students the importance of understanding the vocabulary associated with any topic of discussion. Provide guided practice to better understand how to use the Triple-Entry Vocabulary Journal effectively by completing an entry for a new word that is important for the content of the lesson, i.e., a vocabulary word that is necessary to know.
 - Ask students to write interphase in their Triple-Entry Vocabulary Journal and fill in the other columns together as a class.
 - Remind students to begin by locating the text explanation and recording it in the left column under “word in context”.
 - Stress that writing a definition in one’s own words means it must be paraphrased while still retaining the same meaning/ understanding as the text definition.
11. In order to enhance student interaction with the word/content and with their peers.
 - Have students talk about how they would define the word before asking for suggestions for their entry.
 - Encourage students to create their own memory aids and share them in small groups or with the whole class.
 - Invite two students to add words, definitions, connection phrases, and pictures to the Triple-Entry Vocabulary Journal on the board. Having additional examples will help students, when they work in pairs or independently, to complete entries for future words that will be added to the journal.
12. During Learning: Students will discuss and synthesize ‘textbook’ definitions using visualization and personal connections to deepen their understanding of how to define and retain new vocabulary.
 - Teacher facilitation: Tell students to continue to use the Triple-Entry Vocabulary Journal as lessons continue. Stop and have students add the terms most pertinent to the knowledge being presented, but inform them to add additional words necessary for their own/individual learning. As this becomes habitual for the students, the teacher can pass on the responsibility, of entering words into the journal, to the student.

Advantages

- † Students actively engage with the material – this technique allows multiple interactions between students and the topic/text.
- † Students are able to connect between current and prior materials more easily.

- † Students are more motivated to find connections between the lesson and their own experiences. Knowledge is made personally relevant.
- † Students develop a vocabulary pool to which they can return, identifying recurring terms and drawing new connections—particularly those arising from continuous interaction with the vocabulary.

Triple-Entry Journal Template

Triple -Entry Vocabulary Journal

Word in Context

1

Write the vocab word and any necessary context/usage.

Definition
(in My Own Words)

2

Re-write the definition in words that you can understand, accurately and precisely.

Picture/Memory Aid/Phrase

3

Write any key information that is needed to recall or understand the word accurately.

Unit 1: Lesson 1 - Assessment

Section 1: True or False

1. Another term for a proposition is judgment.
2. A proposition, or judgment, is a sentence that can either be true or false.
3. Rational judgments are statements we know which do not require our senses nor revelation.
4. The existence of God is a rational judgment.
5. In Islamic thought, science and religion are seen as completely separate with no overlap.
6. Propositional knowledge in Islamic theology is about statements that can be true or false.

Section 2: Multiple Choice

7. Epistemology is the study of:
 - a. Philosophy
 - b. Alleles
 - c. Knowledge
 - d. History
8. What is the correct definition of a proposition?
 - a. A statement which must be true.
 - b. A statement that must be negated.
 - c. A statement which can either be true or false. •
 - d. A formal written suggestion or plan to discuss with others.
9. State whether each statement is an example of the principle of non-contradiction (PNC) or the principle of the excluded middle (PEM).
 - a. It is raining here right now.
 - b. A car is red.
 - c. A coin toss.
 - d. Three is an odd number.
 - e. A statement cannot be both true and false at the same time.

10. What body of knowledge in Islam is dependent on true reports?
 - a. Hadīth
 - b. Research
 - c. Seerah
 - d. d. All of the above
11. Which of the following is NOT a source of knowledge in Islamic epistemology?
 - e. The five senses.
 - f. The intellect (al-'aql)
 - g. Inspiration (Ilhām)
 - h. Astrology
12. What does the Qur'anic verse "So where are you going?" (Surāh At-Takwīr, Verse 26) encourage?
 - i. Historical study
 - j. Questioning and deep thinking
 - k. Blind faith
 - l. Memorization of facts
13. Choose the BEST answer for the following questions: The statement – "Human beings can live without the Sun" is:
 - a. Necessary
 - b. Possible
 - c. Impossible

Section 3: Short Answer

4. If testimonial knowledge (true reports) relies on a person to convey the information, how can we know if the report is true? What makes a testimony valid?
5. Explain the Correspondence Theory of Truth using an example.
6. What are the 4 sources of knowledge that Islamic epistemology recognizes? Are they the same sources of recognized by naturalistic epistemology?

Unit 1: Lesson 1- Assessment (Teacher's Edition)

Section 1: True or False

1. Another term for a proposition is judgment. > TRUE FALSE
2. A proposition, or judgment, is a sentence that can either be true or false. > TRUE FALSE
3. Rational judgments are statements we know which do not require our senses nor revelation. > TRUE FALSE
4. The existence of God is a rational judgment. > TRUE FALSE
5. In Islamic thought, science and religion are seen as completely separate with no overlap. TRUE > FALSE
6. Propositional knowledge in Islamic theology is about statements that can be true or false. > TRUE FALSE

Section 2: Multiple Choice

7. Epistemology is the study of:
 - a. Philosophy
 - b. Alleles
 - c. *Knowledge* •
 - d. History
8. What is the correct definition of a proposition?
 - a. A statement which must be true.
 - b. A statement that must be negated.
 - c. *A statement which can either be true or false.* •
 - d. A formal written suggestion or plan to discuss with others.

9. State whether each statement is an example of the principle of non-contradiction (PNC) or the principle of the excluded middle (PEM).

- a. It is raining here right now. *PEM - It is either raining or not raining at a given time, no third option, and both can not happen simultaneously.*
- b. A car is red. *PNC - A car can not be both red and not red at the same time, it is either red or not red. BUT cars can be other colors, so there is a possibility for a other options.*
- c. A coin toss. *PEM - a coin toss will either land heads or tails, there is no third possibility.*
- d. Three is an odd number. *PEM - a number is either even or odd, no other category.*
- e. A statement cannot be both true and false at the same time. *PNC - definition of PNC, if a statement is true, its negation must be false, and vice versa.*

10. What body of knowledge in Islam is dependent on true reports?

- a. Hadīth
- b. Research
- c. Seerah
- d. **d. All of the above •**

11. Which of the following is NOT a source of knowledge in Islamic epistemology?

- a. The five senses.
- b. The intellect (al-'aql)
- c. Inspiration (Ilhām)
- d. **Astrology •**

12. What does the Qur'anic verse "So where are you going?" (Surāh At-Takwīr, Verse 26) encourage?

- a. Historical study
- b. **Questioning and deep thinking •**
- c. Blind faith
- d. Memorization of facts

13. Choose the BEST answer for the following questions: The statement – "Human beings can live without the Sun" is:

- a. Necessary
- b. Possible
- c. **Impossible •**

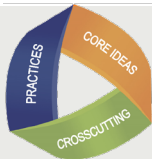
Section 3: Short Answer

4. If testimonial knowledge, or true reports, relies on a person to convey the information, what is the truth of such reports dependent on? Explain. What would make their testimony more valid? *Testimonial knowledge rests on the reliability of the person conveying the report, if they are an honest person. Having other witnesses, having other proofs that they witnessed the information or event, and/or having others testify to their honest character (reputation of honesty) would all make their testimony stronger. [This is helpful for further thought/prep for the lesson on Hadith and reporting Hadith - in Unit 6.]*
5. Explain the Correspondence Theory of Truth using an example. *Correspondence Theory of Truth states that for a statement to be true things must be described according to it is reality. For example, let us examine the proposition "some cats meow." Is it true that some cats meow? Yes, this corresponds to the reality and fact that some cats meow.*
6. What are the 4 sources of knowledge that Islamic epistemology recognizes? Are they the same sources of recognized by naturalistic epistemology? *There are 4 sources of knowledge: five senses, intellect, true reports, and inspiration. Not the same recognized by Naturalists. Naturalists would accept only the five senses because they only accept that which is empirical.*

UNIT 1: WHAT DO WE KNOW & HOW DO WE KNOW IT?**Lesson 2: The Spectrum of
Certainty and Judgment Types****REASONING EXERCISES IN RELIGION & SCIENCE**

Unit: 1
Lesson: 2

Time
Length:
45–50 min

**NGSS Instructional Outcomes**

Next Generation Science Standards

Science and Engineering Practices:

- † Analyzing and Interpreting Data: Students analyze different types of propositions and judgments, assessing their truth and validity.
- † Engaging in Argument from Evidence: The activity of classifying various propositions and providing justifications aligns with this practice.

Crosscutting Concepts:

- Cause and Effect: Understanding the sources of various types of knowledge and how they lead to different conclusions.
- Systems and System Models: This lesson involves considering how different systems of thought (scientific and religious) process and interpret information.

**CCSS Instructional Outcomes**

Common Core State Standards

Mathematics Standards:

CCSS.Math.Practice.MP2: Reason abstractly and quantitatively. This is applicable as students are dealing with abstract concepts like rational and empirical judgments.

CCSS.Math.Practice.MP3: Construct viable arguments and critique the reasoning of others, particularly relevant in discussing and justifying types of judgments.

ELA Standards for Literacy:

CCSS.ELA-Literacy.RST.6-8.2 & 9-10.2: Determine the central ideas or conclusions of a text; provide an accurate summary of the text distinct from prior knowledge or opinions.

CCSS.ELA-Literacy.RST.6-8.8 & 9-10.8: Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

ELA Standards for Speaking and Listening:

CCSS.ELA-Literacy.SL.9-10.1 & 11-12.1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 9-12 topics and texts.

Content Learning Outcomes:

1. Define, provide examples, and explain the relationship between the three types of propositions (rational, revelatory, empirical).
2. Classify various propositions and provide justification.
3. Demonstrate the position of scientific propositions in the Islamic epistemological framework.

Materials:

- † Presentation Slides: Slides 20–30
- † Judgment/Proposition Worksheet
- † God's Existence Rational Judgment (Supplemental Material)
- † Proofs of Prophethood Rational Judgment (Supplemental Material)
- † Spectrum of Certainty
- † Unit 1: Lesson 2 Assessment Questions

Instruction/Teacher Facilitation:

SLIDE 13:

Begin by reminding students/asking students about the sources of knowledge from the previous lesson.

1. The five senses
2. The intellect (*al-'aql*)
3. True reports
4. Inspiration (*Ilhām*)

Is everything that we know, from these various sources of knowledge, all on the same level of certainty? Is everything I know 100% certain, or are there things that I know, or I think I know, that are not exactly 100% true? There are things that I know that are not true at all, 100% false, and other things that I know that might not be true, but I do not know for sure. This demonstrates that there are degrees of certainty.

SLIDE 20:

[Teacher can post this spectrum so that it is visible to students and easy to refer to page 51.]

- † Take the proposition of climate change. Is climate change real/occurring?
 - Research is being done and is ongoing, but how certain are we?
 - † Certain it is true (*yaqīn, qaṭ'i*) 100% true (verified or guaranteed)
 - † Probable (likely) to be true (*ẓann rājiḥ*) 51-99% true
 - † Doubt (*shakk*) 50% true i.e., 50/50 chance that it is true or it is false
 - † Improbable (unlikely) to be true (*ẓann marjūḥ*) 49-1% true
 - † Certain it is false (*baatil*) 0% true or 100% false
- (Note: the percentages used are only for comprehension purposes.)

SLIDE 21

- † As a Muslim, this is how we interpret our findings.
 - E.g., Allah SWT refers to this concept in Surāh An-Nīṣā: 4: 157

وَقَوْلِهِمْ إِنَّا قَتَلْنَا الْمَسِيحَ عِيسَى ابْنَ مَرْيَمَ رَسُولَ اللَّهِ وَمَا قَتَلُوهُ
وَمَا صَلَبُوهُ وَلَكِنْ شُبِّهَ لَهُمْ وَإِنَّ الَّذِينَ اخْتَلَفُوا فِيهِ لَفِي شَكٍّ
مِّنْهُ مَا لَهُمْ بِهِ مِنْ عِلْمٍ إِلَّا اتَّبَاعَ الظَّنِّ وَمَا قَتَلُوهُ يَقِينًا ١٥٧

- And [for] their saying, “Indeed, we have killed the Messiah, Jesus the son of Mary, the messenger of Allah.” And they did not kill him, nor did they crucify him; but [another] was made to resemble him to them. And indeed, those who differ over it are in **doubt** about it. They have no knowledge of it except the following of **assumption**. And they did not kill him, for **certain**.
- Allah SWT is stating the truthfulness of the statement about Īsā (A)
- The proposition being made in this verse is “Indeed, we have killed the Messiah.” So now its level of truth is being examined.
- Yaqīn (certainty), shakk (doubt) and ann (uncertainty/plausible) are used in this verse.
- The Jewish view is mentioned (that they killed Īsā (A)) and the Christian view is mentioned (that Īsā (A) was crucified). It is clear from the verse that both groups were in doubt/shakk. But when Allah denied that they killed Īsā (A), He used the term yaqīn; this indicates absolute certainty. So we need to analyze the information or knowledge we are presented with and judge its level of truth/certainty. We also need to look at what type of judgment is being made.

SLIDE 22

Judgments or Propositions (**ḥukm**): (propositions were introduced in the last lesson, remind students that a proposition is a statement that can be either true or false.)

[Hand out the Judgment/Proposition Worksheet on page 52.]

† There are 3 types of Judgments

- **Revelatory Judgments**: these are statements that are only known from Allah SWT and His Messenger ﷺ.
 - E.g., Fasting during Ramadan is fard/obligation.
 - E.g., The previous example about Īsā (A).
 - Source of knowledge = Qur’an & hadīth
- **Rational Judgment**: these are statements that we can comprehend without requiring experimentation or revelation.
 - E.g., $1+1=2$, 7 is not an even number
 - Source of knowledge = intellect/aql (we can think about it ourselves)
- **Empirical Judgment**: these are statements we know only from our five senses and through experimentation.
 - E.g., fire burns, the speed of light is 299,792,458 m/s
 - Source of knowledge = 5 senses

- † Part of critical thinking and using *aqI* is to be able to identify and categorize propositions/ judgments correctly.
- † Under judgments, we also have two classifications:
 - 5. Self-evident (*badi-hi*) Judgments which do not require thought
 - Something that is obvious and does not require extensive thought processes.
 - 6. Inferential Judgments that require thought
- † Revelatory Judgment
 - Self-evident: the 5 pillars of Islam
 - Inferential: there is no zakat on diamonds
- † Rational Judgment
 - Self-evident: one is half of two
 - Inferential: 40 divided by 4 is 10
- † Empirical Judgment
 - Self-evident: fire burns
 - Inferential: Pepto Bismol treats indigestion

SLIDE 23: Judgment/Proposition Worksheet

Group Practice: Give students 5 minutes to fill out the chart below. Then go over the answers with them as a group.

Rational, Empirical, or Revelatory?			
Judgment	Rational	Empirical	Revelatory
Water boils at 212°F		•	
God Exists	•		
Force is mass times acceleration		•	
Paradise exists			•
Muhammad ﷺ is the Messenger of God	•		
Tylenol relieves pain		•	
Humans will be resurrected			•

[Note: This chart can be connected to a Biology/Chemistry topic of physical properties vs chemical properties which falls under the empirical category, but the thought and reasons why it is categorized that way should be explored.]

Discuss the reasons for each answer:

1. Water boils at 212°F: Empirical – observable; when the thermometer reaches 212°, the water boils
2. God Exists: Rational – and revelatory text, but actually a rational judgment.
 - Fit is the definition of what a rational judgment is. A judgment that does not require empirical knowledge and revelatory knowledge. One can sit and think about it without other sources of knowledge.
 - Strengthened with empirical knowledge and revelatory knowledge.
3. Force = mass times acceleration: Empirical – This is confirmed through testing and calculation.
4. Paradise exists: Revelatory – We know the existence of paradise, and likewise hell, only because they are mentioned in scriptural texts. They cannot be observed or rationally thought out.
5. Muhammad ﷺ is the Messenger of God: Rational – Yes, it is mentioned in revelatory texts, but when we look at the life/seerah of the Prophet ﷺ, we can come to a rational conclusion that he was able to do what he did only because he was the Prophet of Allah SWT.
 - Sahābah experienced him ﷺ - We use testimonial knowledge or true reports.
 - Proofs of Prophethood (page 55-56) - We have proof from a variety of aspects that verify Muhammad ﷺ's Prophethood and it is legitimacy.
6. Tylenol relieves pain: Empirical – A person can take the medicine and feel its effects.
7. Humans will be resurrected: Revelatory – We only know this because it is mentioned in revelatory (scriptural) texts.

SLIDE 24:

- † Both Rational and Empirical judgments can be further divided into 3 categories:
 - Necessary: that which cannot be negated.
 - Possible: that which can be affirmed or negated.
 - Impossible: that which cannot be affirmed.
- † E.g., “Zaid is eating.” This is a possible statement. It is impossible for Zaid to be eating and not eating at the same time.

Guided Practice

SLIDE 25: Rational Judgments

Determine if each of these propositions is necessary, possible, or impossible.

Necessary, Possible, or Impossible?			
Rational Proposition	Necessary	Possible	Impossible
The sum of the parts of a thing can be greater than the whole			•
Extraterrestrial life exists		•	
Matter takes up space	•		
Rational Proposition	Necessary	Possible	Impossible
The creation of the cosmos		•	
My hand burns when I put it in fire		•	
The sun is 91.414 million miles away from the earth		•	
A human can be 1 mile away from the sun and not burn		•	
A square circle			•
God does not exist			•

- † Rationally speaking, do these statements imply contradictions?
- The sum of the parts of a thing can be greater than the whole - **Impossible**, because there is contradiction within the statement it iself. The whole should be equal to the sum of it is parts.
 - Extraterrestrial life exists - **Possible**
 - Matter takes up space - **Necessary**, because this is the very definition of matter.
 - The creation of the cosmos - **Possible**
 - My hand burns when I put it in fire - **Possible**, not necessary because perhaps it does not burn the person, if he/she is wearing something protective, or puts the hand in fire only for a second. For example, when Ibrāhīm (A) was thrown into the fire, it did not burn him.
 - The Sun is 91.414 million miles away from the Earth - **Possible**; they did not go out and measure it, but it is an estimation based on probability techniques.
 - A human can be 1 mile away from the Sun and not burn - Again, **possible**, maybe they are 1 mile away in a protective pod, Allah SWT decides it will not burn.
 - A square circle - again, by definition, this is **impossible**.
 - God does not exist - **Impossible**, going back to the rational proofs of God's existence.

SLIDE 26: Empirical Judgments

Necessary, Possible, or Impossible?			
Rational Proposition	Necessary	Possible	
Sound travels four times faster in water than it does in air	•		
There are 118 elements on the periodic table.		•	
Carbon can have 20 electrons			•
On Earth, water boils at 20 degrees Celsius			•
The Sun is 91.414 million miles away from the Earth		•	
A human can be 1 mile away from the Sun and not burn			•

- Sound travels four times faster in water than it does in air – **Necessary**, because particles are much closer in water so they can quickly transmit vibration energy from one particle to another.
- There are 118 elements on the periodic table – **Possible**, because more can be discovered, but this is the state of our knowledge today.
- Carbon can have 20 electrons – **Impossible**, because if an element has 20 electrons, it would be calcium. Carbon is carbon due to it is 6 electrons.
- On Earth, water boils at 20 degrees Celsius – **Impossible**, because water boils at 100° Celsius, 212° F. This is an empirical fact.
- The Sun is 91.414 million miles away from the Earth – **Possible** because this can be observed through instruments.
- A human can be 1 mile away from the Sun and not burn – **Impossible**, because the heat of the sun would burn the person, practically/ empirically speaking (As a Rational judgment, it is possible).
- Thick clothing conceals my body – **Necessary**, because by definition, thick clothing is one that conceals.

SLIDE 27–29

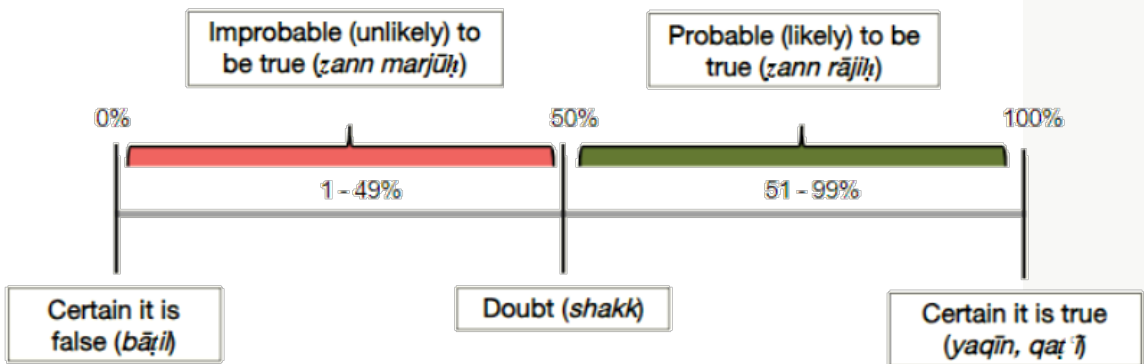
- † Relationship between rational judgments and empirical judgments?
 - ALL empirical judgments can only fall under possible rational judgments.
 - Impossible rational judgments can never be observed anyway; can never exist (because it is impossible).
 - Scientific judgments fall under the category of possible empirical judgments.

SLIDE 30

- † What about the level of certainty of such judgments?
 - Are they **qaṭʿī** - Conclusive - a proposition that we are absolutely certain of or a text that does not admit to more than one meaning (can have only one meaning).
 - Or are they **zannī** - Probabilistic - a proposition that we are not certain of or a text that can have more than one meaning.
 - Remember, “certain” means 100% true

Spectrum of Certainty (Truth)

NOTE: percentages are used *only* for understanding purposes



- Certain it is true (*yaqīn, qat'ī*) - 100% true (verified or guaranteed): Qur'an and mutawatir hadīth
- Probable (likely) to be true (*zann rājih*) - 51-99% True
- Doubt (*shakk*) - 50% true i.e., 50/50 chance that it is true or it is false
- Improbable (unlikely) to be true (*zann marjūh*) - 49-1% True
- Certain it is false (*baatil*) - 0% true [or 100% false]

Example: Proposition of climate change Is climate change real/ occurring?

Research is being done and is ongoing, but how certain are we?

Worksheet: Judgments or Propositions (ḥukm)

A judgment or a proposition is a statement (or a truth claim) that can be *either* true or false.

- † There are 3 types of Judgments:
- 1. **Revelatory Judgments** these are statements that are only known from Allah SWT and His Messenger ﷺ. E.g., Fasting during Ramadan is fard/obligation. The previous example about Īsā (A).
Source of knowledge = true report
 - 2. **Rational Judgment** these are statements we know that do *not* require our senses nor revelation. E.g., 1+1=2, 7 is not an even number
Source of knowledge = intellect/aql (we can think about it ourselves)
 - 3. **Empirical Judgment** these are statements we know only from our five senses. E.g., fire burns, the speed of light is 299,792,458 m/s
Source of knowledge = 5 senses

Directions: Determine if each of these statements is a rational, empirical, or revelatory judgment. Place a checkmark in the appropriate column.

Rational, Empirical, or Revelatory?			
Judgment	Rational	Empirical	Revelatory
Water boils at 212°F			
God Exists			
Force is mass times acceleration			
Paradise exists			
Muhammad is the Messenger of God			
Tylenol relieves pain			
Humans will be resurrected			

Judgments can be further categorized by need or probability.

† Both Rational and Empirical can be further divided into 3 categories:

- 1. Necessary that which cannot be negated.
- 2. Possible that which can be affirmed *or* negated.
- 3. Impossible that which cannot be affirmed.

Directions: Determine if each of these rational propositions is necessary, possible, or impossible. Place a checkmark in the appropriate column.

Rational, Empirical, or Revelatory?			
Rational Proposition	Necessary	Possible	Impossible
The sum of the parts of a thing can be greater than the whole			
Extraterrestrial life exists			
Matter takes up space			
The creation of the cosmos			
My hand burns when I put it in fire			
The sun is 91.414 million miles away from the earth			
A human can be 1 mile away from the sun and not burn			
A square circle			
God does not exist			

Directions: Determine if each of these *empirical* propositions is necessary, possible, or impossible. Place a checkmark in the appropriate column.

Rational, Empirical, or Revelatory?			
Empirical Proposition	Necessary	Possible	Impossible
Human beings can live without the Sun			
Sound travels four times faster in water than it does in air			
There are 118 elements on the periodic table			
Carbon can have 20 electrons			
On Earth, water boils at 20 degrees Celsius			
The Sun is 91.414 million miles away from the Earth			
A human can be 1 mile away from the Sun and not burn			
Thick clothing conceals my body			

Relationship between rational judgments and empirical judgments:

- † ALL empirical judgments can *only* fall under *possible* rational judgments.
 - Impossible rational judgments can never be observed anyway; can never exist (because it is impossible).
 - *Scientific* judgments then fall under the category of *possible* empirical judgments.
- † Judgments Level of Certainty (Truth):
 - *Qaṭʿī* Conclusive a proposition that we are *absolutely certain* of or a text that does *not* admit to more than one meaning (can have *only one meaning*).
 - Conclusive or “certain” means 100% true
 - *Zannī* Probabilistic a proposition that we are *not certain* of or a text that does admit to *more than one meaning*.
 - There is some level of doubt in it. (not 100% true, but also not 100% false)

SUPPLEMENTAL MATERIAL

Proofs of Prophethood Ithbât an-Nubuwwa

This document outlines various proofs of the Prophethood of Muhammad ﷺ, emphasizing the importance of Prophethood in Islam, Muhammad ﷺ's exemplary character, accomplishments, message, prophecies, physical miracles, and the inimitability of the Qur'an.

1. Humanity's need for Prophethood

- **Spiritual Necessity:** Prophethood is essential for spiritual fulfillment and understanding God's purpose. Prophets convey knowledge that is beyond human comprehension.
- **Moral Necessity:** Prophets provide divine guidance for morality, beyond humanistic ethics.
- **Historical Necessity:** The historical context necessitated divine intervention to guide humanity.
- **Biblical Necessity:** References to a Prophet like Moses and the awaited Prophet in Biblical texts hint at Muhammad ﷺ's coming.

2. The Prophet's Character

- Prophet Muhammad ﷺ's honesty, integrity, simplicity, humility, mercy, compassion, clemency, forgiveness, bravery, valor, generosity, perseverance, and trust in God as exemplary virtues that support his Prophethood.

3. The Prophet's Accomplishments

- Prophet Muhammad ﷺ's accomplishments included fostering a community with profound love, achieving unparalleled success in his mission, restoring monotheism, revolutionizing human rights, and molding a generation that exemplified his teachings.

4. The Inimitable Qur'an

- The Qur'an's miraculous nature and its challenge to produce something similar in terms of its literary excellence, knowledge of the past, and preservation over time, asserts its divine origin and thus Muhammad ﷺ's prophethood because he was the avenue of its revelation and receiving.

5. The Prophet's Message

- Details the core aspects of Muhammad ﷺ's message including monotheism, faith in destiny, the importance of prayer, fasting (Qiyām), moral and societal reforms, and contributions to science and medicine.

6. The Prophet's Prophecies

- There are numerous prophecies made by Muhammad ﷺ that were fulfilled such as the Byzantine victory, detailed future events, descriptions of the end times, and moral and societal changes that were to occur.

7. The Prophet's Physical Miracles

- There are various miracles attributed to Muhammad ﷺ including the splitting of the moon, the night journey (Isra and Mi'raj), weeping trees, speaking stones, and miraculous provisions of food and water, which reinforced his prophethood.

SUPPLEMENTAL MATERIAL

God's Existence:

The understanding of God’s existence is confirmed and strengthened with empirical observation and revelatory text, but in essence, it is a rational judgment.

Below are some resources that explain the rational argument for God’s existence. Scan the QR codes to watch the videos.

- [God Exists | Why Islam is True | Shaykh Hamza Karamali](#)
- [What Is a Necessary Being? | Why Islam is True | Shaykh Hamza Karamali](#)
- [Prove that God Exists, with Sh. Hamza Karamali | DoubleTake, a Yaqeen Podcast](#)
- [God's Existence & Science with Dr. Shoaib Mali](#)



Unit 1: Lesson 2: Assessment

Section 1: True or False - Indicate whether each of the following statements are TRUE or FALSE.

1. In Islamic epistemology, the statement 'God exists' is considered an empirical judgment.

TRUE FALSE

2. 'Force is mass times acceleration' is an example of a revelatory judgment.

TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. Which type of judgment relies solely on the five senses?

- a. Rational
- b. Revelatory
- c. Empirical
- d. Philosophical

4. A judgment that is known only from Allah SWT and His Messenger (S) is categorized as:

- a. Rational
- b. Empirical
- c. Revelatory
- d. Analytical

5. Judgments that do not require thought and are immediately understood are known as _____ judgments.

6. A judgment that can be affirmed or negated and falls under both rational and empirical categories is known as a _____ judgment.

Section 3: Short Answer - Write a well-formulated response for each of the following.

7. Explain the difference between 'necessary' and 'impossible' judgments within the context of rational judgments.

8. Discuss how the concept of certainty or 'truth-ness' in judgments (Qat'i and Zanni) affect the understanding of scientific propositions in the Islamic epistemological framework.

9. Matching Exercise - Match the following statements with the correct type of judgment (Rational, Empirical, or Revelatory).

Humans will be resurrected after death. - _____

Water boils at 212°F (100°C) at sea level. - _____

The sum of angles in a triangle is 180 degrees. - _____

10. Draw a diagram/chart that represents the spectrum of certainty.

11. Why do we need the truth spectrum when we have principles like the principle of non-contradiction and the excluded middle?

Unit 1: Lesson 2: Assessment - (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements are TRUE or FALSE.

1. In Islamic epistemology, the statement 'God exists' is considered an empirical judgment.

TRUE FALSE

2. 'Force is mass times acceleration' is an example of a revelatory judgment.

TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. Which type of judgment relies solely on the five senses?

- a. Rational
- b. Revelatory
- c. Empirical
- d. Philosophical

4. A judgment that is known only from Allah SWT and His Messenger (S) is categorized as:

- a. Rational
- b. Empirical
- c. Revelatory
- d. Analytical

5. Judgments that do not require thought and are immediately understood are known as self evident judgments.

6. A judgment that can be affirmed or negated and falls under both rational and empirical categories is known as a possible judgment.

Section 3: Short Answer - Write a well-formulated response for each of the following.

7. Explain the difference between 'necessary' and 'impossible' judgments within the context of rational judgments.

Necessary judgments are those that cannot be negated and are often definitions or logical truths (e.g., 'The whole is greater than

the part'). Impossible judgments are those that cannot be affirmed because they contain a contradiction or defy logic (e.g., 'A square circle').

8. Discuss how the concept of certainty or 'truth-ness' in judgments (Qat'i and Zanni) affect the understanding of scientific propositions in the Islamic epistemological framework.

In Islamic epistemology, Qat'i refers to conclusive propositions that are certain and unequivocal, while Zanni pertains to probabilistic propositions that are not absolutely certain. Understanding this categorization is crucial in the Islamic framework, as it influences how scientific propositions are interpreted. Scientific judgments, often empirical and subject to change with new evidence, are generally considered Zanni. This categorization acknowledges the evolving nature of scientific knowledge and its potential alignment or divergence with established religious truths (Qat'i).

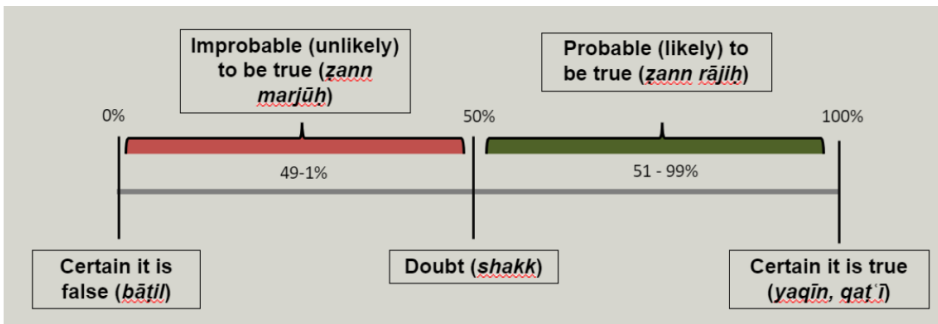
9. Matching Exercise - Match the following statements with the correct type of judgment (Rational, Empirical, or Revelatory).

Humans will be resurrected after death. - **Revelatory**

Water boils at 212°F (100°C) at sea level. - **Empirical**

The sum of angles in a triangle is 180 degrees. - **Rational**

10. Draw a diagram/chart that represents the spectrum of certainty.



11. Why do we need the truth spectrum when we have principles like the principle of non-contradiction and the excluded middle?

Not everything can be proven true or false. There are many things in this world that there is partial truth to, and there are some things that we might not be 100% sure about (or unable to be 100% sure about). So a spectrum allows us to understand how much reliance a statement has, and how to use it. (True or false items can be used for more definitive parts of life, but for more situational conditions, what is most probable might be used, for example, if a medication would work or not.)

UNIT 1: WHAT DO WE KNOW AND HOW DO WE KNOW IT?

Unit: 1

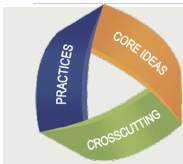
Lesson: 3

Time

Length:

45–50 min

Lesson 3: Overlapping Naturalistic and Islamic Epistemologies



NGSS Instructional Outcomes

Next Generation Science Standards

Science and Engineering Practices:

- † Engaging in Argument from Evidence: Students will engage in discussions about the validity of different types of judgments in naturalistic and Islamic epistemologies.
- † Obtaining, Evaluating, and Communicating Information: The lesson includes evaluating different sources of knowledge and communicating the distinctions between naturalistic and Islamic perspectives.

Crosscutting Concepts:

- † Cause and Effect: Understanding the influence of different epistemological beliefs on the interpretation of scientific and religious knowledge.
- † Systems and System Models: Exploring how different systems of thought (naturalistic and Islamic) process and interpret information.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards for Literacy:

CCSS.ELA-Literacy.RST.6-8.2 & 9-10.2: Determining the central ideas or conclusions of a text; providing an accurate summary of the text distinct from prior knowledge or opinions.

CCSS.ELA-Literacy.RST.6-8.8 & 9-10.8: Distinguishing among facts, reasoned judgment based on research findings, and speculation in a text.

English Language Arts Standards for Speaking and Listening:

CCSS.ELA-Literacy.SL.9-10.1 & 11-12.1: Initiating and participating effectively in a range of collaborative discussions on various topics and texts, integrating diverse perspectives.

History/Social Studies Standards:

CCSS.ELA-Literacy.RH.6-8.2 & 9-10.2: Provide a summary of a text distinct from personal opinions or judgments, especially relevant when discussing historical figures like Karl Popper and their philosophical contributions.

Content Learning Outcomes:

1. Define, provide examples, and explain the relationship between the three types of propositions/judgments (rational, revelatory, empirical).
2. Demonstrate the position of scientific propositions in the Islamic epistemological framework.
3. Explain the differences between Islamic epistemology and Naturalistic epistemology and how each views the various judgments.

Materials:

- † Presentation Slides 31–42
- † Triple-Entry Vocabulary Journal Instructions Teacher-led
- † Youtube Video Chapter 1.4: Karl Popper and the logic of falsification

Instruction/Teacher Facilitation:

Review

Begin by reminding students/asking students about the sources of knowledge, and the levels of certainty from the previous lesson. [Use one of the examples/scenarios students have come up with in Lesson 1 from the Sources of Knowledge Graphic Organizer Activity and have the Spectrum of Certainty posted in a visible place in the classroom.]

- † Sources of knowledge
 - The five senses
 - The intellect (*al-'aql*)
 - True reports
 - Inspiration (*Ilhām*)
- † The Spectrum of Certainty
 - Certain it is true (*yaqīn, qath'i*) 100% true (verified or guaranteed)
 - Probable (likely) to be true (*ẓann rājiḥ*) 51-99% true
 - Doubt (*shakk*) 50% true i.e., 50/50 chance that it is true or it is false
 - Improbable (unlikely) to be true (*ẓann marjūḥ*) 49-1% true
 - Certain it is false (baathil) 0% true or 100% false
- † So we need to analyze the information or knowledge we are presented with and judge its level of truth. We also need to look at what type of judgment is being made.
- † Review/orally quiz students on the 3 Judgment Types (from lesson 2)
 - Revelatory Judgment: these are statements that are only known from Allah SWT and His Messenger ﷺ.
 - Rational Judgment: these are statements we know which do **not** require our senses nor revelation.
 - Empirical Judgment: these are statements we know only from our five senses.

SLIDE 31: Naturalism

Introduce Naturalism:

- † A philosophy/philosophical school that maintains the idea that **only** natural laws and forces operate in the universe and reality is **explainable** through nature and natural laws; it denies supernatural influence.

- † A belief that everything *arises* from natural properties or causes.
- † Science is the study of natural properties and causes.
- † Therefore, science can discover everything.

SLIDE 32–33: Naturalistic Epistemology

Out of the 3 different types of judgments, the naturalistic epistemology is based the naturalistic epistemology only accepts empirical (mainly) and rational judgements as sources of knowledge.

- † The assumption for the naturalist is that this is reality. His empirical judgments are necessary because he has no other source of knowledge. As a result, he is limited in his sources, and therefore, limited in his knowledge.
- † In contrast, Islamic epistemology makes use of all three judgments: rational judgments, revelatory judgments, along with empirical judgments. We can also say that empirical judgments are not always necessary due to the fact that we have other sources of judgment.
- † Q: How do naturalists answer the question about God or God's existence? • *A: For the naturalist, there is no supernatural God who creates nature. Naturalism rejects God, the supernatural, and life after death because these beliefs cannot be proven by the scientific method. Science is all about empirical observations and associations. (E.g., Pavlov's conditioning the salivating dog.)*

SLIDE 34: Revelatory Judgments

- † How do naturalists view revelatory judgments?
 - Naturalists view revelatory judgments as superstitions.

SLIDE 35

- † How would a Muslim answer the question about God or God's existence?
 - As discussed earlier, the existence of God is a rational judgment.
 - **Contingency Argument** need for a cause/beginning, "initial mover"
 - E.g., Line of leaning people must have something at the beginning to hold them all up. That beginning must be unique compared to the rest of the line (composed of all leaning people, the beginning cannot be leaning).
 - $A \rightarrow B \rightarrow C \rightarrow D = B, C, \text{ and } D \text{ are contingent (dependant)}$

Dependency can then only be fulfilled by an independent element at the beginning. i.e., the universe is dependant, and God is independent. (This is why God's existence is a rational judgment. There is a rational thought behind it.)

SLIDE 36: Islamic vs Naturalistic Epistemology

Islamic epistemology is not as limiting as the naturalistic view.

- † Islam/Muslim scholars make use of all established sources of knowledge as evidence for a claim.
- † Justification for a claim can and usually goes beyond the empirical. Therefore, the Islamic epistemology has a more vast knowledge base.

Comparing and Contrasting the two epistemologies: (Present/View "Justified Beliefs"/ "Unjustified Beliefs" Slide)

SLIDE 37: Activities

Critical Thinking Questioning (Whole-group activity)

- † What kinds of overlap are possible?
 - Overlap empirical judgments, accepted truths

SLIDE 38: Conflicts

- † Where does the conflict arise between the two epistemologies?
 - Concepts of *ghaib*/the unseen; E.g., miracles - definition of a miracle (from a religious perspective) is when the common association that "God created" does not happen, with or without an empirical cause.
 - Conflicts will arise whenever scientists use *their* naturalistic epistemology to state something as true or false, and Muslims use *their* Islamic epistemology to state something as true or false.
 - Muslims say yes, miracles are possible, Naturalists say no, miracles are not possible.

SLIDE 39: Unseen

Delving further into how the topic of ghaib/unseen, revelation, and God/religion are addressed by scientists, let us look at the views of Karl Popper, one of the 20th century's most influential philosophers of science.

Karl Popper and the Unseen

- † Karl Popper investigated the nature of knowledge. [Teacher can question students what this is called. Answer: Epistemology, which is defined as the study of knowledge and how we know things.]
- † He was critical of everything in science. He looked at ways we could test science, and challenge its claims.
- † Well-known for his ***Falsification Principle*** which states that a theory or idea should ***not*** be considered scientific unless it could, in principle, be proven false. "It is easy to obtain confirmations, or verifications, for nearly every theory if we look for confirmations," Popper said. But if we want to be scientific, our mission would not be to look for the confirming evidence but to refute/falsify evidence instead. He said that real scientists should always be looking at what would make their claim false, because that is the actual job of a scientist, to be critical of any claim.
 - E.g., A scientist observes, "I've always seen white swans, therefore, all swans must be white."
 - Hypothesis – All swans are white
 - Testing it out entails searching everywhere for a different colored swan.
 - But just because the scientist never finds a different colored swan does not mean the theory is true, it just means that it is true right now, until someone finds a different colored swan to falsify the theory.
 - Popper believed that true scientists do not set out to prove a hypothesis, but should set out to disprove it. And that scientists should only use deduction, and never use induction. (Cannot use any previously claimed principles in their hypotheses because you cannot know if it is actually true. Popper even said that scientists cannot even say that a claim is "probable" or "likely to be true.")
- † This obviously comes with many issues: The major dīśadvantage of falsifiability is that it does not take into account the contributions of sciences that are observational and descriptive.

- We already have a limited amount of observations, so scientists must draw conclusions based on these limited observations. This means scientists must use induction.
- Most philosophers of science unanimously agree that Popper was wrong. We must agree on some basic accepted principles and cannot base everything on deduction alone.
- In order to falsify a theory, you will need to make a lot of assumptions.
- The reason Popper is wrong is that there *must* be a theoretical perspective that guides your thinking (otherwise, you cannot do induction, nor can you do falsification either!) We cannot work within a scientific realm without induction.
- Popper's falsification principle limits science to only observational and empirical data as a way of seeking truth. He also mentioned real scientific theories must be testable. If it cannot be tested, it is not scientific.
- Modern scientific thinking says: Testable means refutable/falsifiable. For Popper, knowledge was about probability and contingency. This means we are justified in believing what seems most probable given our current data, and we should be willing to revise beliefs in the light of new evidence (empirical evidence). In other words, our belief should be contingent/dependent on the data themselves. Popper never believed in certainty; even science is not a way to certainty.
- This makes sense because empiricism is limited to begin with and can never attain truth/certainty on its own. Therefore, you NEED other sources of knowledge.
- Anthony Flew (philosopher and evidentialist) stated that "All statements are meaningful only if they can be empirically verified." Q: Can this statement itself be empirically verified? A: NO, therefore, this statement is a self-refuting claim. (His own words can be used to refute his argument.)

[Teacher Resource: Video on Popper's Understanding and why it is not accepted: Scan QR code to watch the video.



SLIDE 40: Verification Principle

† **Verification Principle:** all statements must be empirically proven to be considered scientific.

- Verifying means that a scientist finds evidence to corroborate a theory's truthfulness.

- This principle asserts that a proposition is meaningful *only* if it can be empirically verified or is analytically true (true by definition). In other words, for a statement to be considered meaningful, there must be some possible observation or set of observations that can confirm it is truth. This principle aims to eliminate metaphysical and speculative assertions that could not be tested through empirical observation or logical analysis.
- This principle faces criticism for being too strict and for excluding many statements that are considered scientifically meaningful but are not directly verifiable (e.g., universal statements and theoretical entities in physics).
- The verification principle is the opposite of the falsification principle. Both represent two different approaches in the philosophy of science and epistemology regarding how to demarcate meaningful or scientific statements from non-scientific ones.
- Verification Principle focuses on the positive *confirmation* of theories. It suggests that a statement is meaningful if it can be *empirically verified* or is true by definition.

Falsification Principle emphasizes the ability to disprove theories. It suggests that a statement is scientific if it can be potentially falsified through empirical observation.

SLIDE 41: Discussion

Culminating Discussion: [Discuss the following questions with the class]

- † How would Karl Popper analyze these propositions?
 - Water boils at 100°C cannot be known with certainty. This is probable for now; what if a condition comes, or we develop a tool that allows water to boil at 110°C instead? Therefore, subject to the falsification principle, we still need to be critical in accepting this as truth.
 - An unseen realm of angels cannot be proven or analyzed empirically.
 - God's existence cannot be proven or analyzed empirically.

What do we do with ethical statements? Popper would say they are meaningless statements because cannot be empirically proven, or more specifically, they cannot be proven false.
 - NOTE: The highest level of certainty, *Qa7* does not exist for Popper/Falsification principle. There is no way of attaining

actual truth, only contingent truth or probability (i.e., everything is *zannī*.)

- The basic understanding is that we have other ways of verifying knowledge beyond empirical verification. Empirical verification can be used, along with rational/intellectual verifications, true reports, etc...

- The Islamic epistemology is not limited to the empirical.

Water boils at 100°C – empirical evidence

An unseen realm of angels exists – revelatory evidence

God exists – rational judgment and revelatory evidence

† Keep in mind: As Muslims or Muslim scientists...

- As long as you bring evidence, the Islamic Epistemology will evaluate it.
- We recognize there can be more than just the evidence that is brought.
- Our thought, as Muslims, is not purely faith-based, we do ask for evidence. **And** we take/accept all three sources of knowledge as evidence, which makes our paradigm more vast and comprehensive.

SLIDE 42: Connecting Back

† Connecting back to Lesson 1:

- How would Muslim scholars respond to Galileo? (contrasting to how the church reacted to Galileo, as presented in the video clip, and the clash between the church and science.
- Muslim scientists would have looked at his claims and examined the evidence for his claims; looking at the source of that evidence and categorizing it based on its level of truth (*qatī* or *zannī* etc.).

Unit 1: Lesson 3 - Assessment

Section 1: True or False

1. Naturalism denies the existence of anything beyond natural laws and forces. TRUE FALSE
2. Karl Popper's falsification principle states that a theory is scientific only if it is verifiable. TRUE FALSE

Section 2: Multiple Choice

3. Naturalistic epistemology primarily relies on which type of judgment?
 - a. Rational
 - b. Revelatory
 - c. Empirical
 - d. Intuitive
4. According to Islamic epistemology, which sources of knowledge are utilized?
 - a. Only empirical
 - b. Only rational and revelatory
 - c. Rational, revelatory, and empirical
 - d. Only revelatory
5. Which of the following best describes the principle ideology of Naturalism?
 - a. Only supernatural forces operate in the universe.
 - b. Reality is explainable solely through nature and natural laws.
 - c. Knowledge comes primarily from revelation.
 - d. Empirical and rational judgments are equally unreliable.
6. According to Islamic epistemology, which type of judgment takes into account the unseen or supernatural?
 - a. Rational Judgment
 - b. Empirical Judgment
 - c. Revelatory Judgment
 - d. Analytical Judgment

7. Karl Popper's falsification principle emphasizes:
 - a. The verification of scientific theories.
 - b. The importance of proving theories true.
 - c. That theories should be disprovable to be scientific.
 - d. The reliance on revelatory knowledge in science.
8. How would a naturalist likely view the concept of miracles?
 - a. As empirical judgments.
 - b. As rational judgments.
 - c. As superstitious or non-scientific.
 - d. As necessary truths.
9. What is a key difference between naturalistic and Islamic epistemologies in terms of knowledge sources?
 - a. Naturalistic epistemology relies only on revelation.
 - b. Islamic epistemology uses only empirical judgment.
 - c. Naturalistic epistemology is based solely on empirical judgments.
 - d. Islamic epistemology does not allow for empirical observations.
10. In Islamic epistemology, how is the existence of God generally understood?
 - a. As an empirical judgment.
 - b. As a revelatory judgment.
 - c. As a rational judgment.
 - d. As an intuitive feeling.
11. The concept of '*yaqīn*' (certainty) in Islamic epistemology implies that:
 - a. Knowledge is always probabilistic.
 - b. Empirical evidence is the only source of certainty.
 - c. Some knowledge can be known with absolute certainty.
 - d. Revelatory knowledge is always uncertain.

Section 3: Short Answer

12. Define 'empirical judgment' and provide an example.
13. Explain Karl Popper's falsification principle in your own words.
14. Discuss the difference between naturalistic and Islamic epistemologies and their approach to understanding the concept of God's existence.

Fill in the Blank:

15. In Islamic epistemology, _____ refers to knowledge gained from Allah SWT and His Messenger.
16. Karl Popper's approach to scientific theories is that they should always be _____.

Unit 1: Lesson 3: Assessment (Teacher's Edition)

Section 1: True or False

1. Naturalism denies the existence of anything beyond natural laws and forces. > TRUE FALSE
2. Karl Popper's falsification principle states that a theory is scientific only if it is verifiable. TRUE > FALSE (Correct answer: Falsifiable)

Section 2: Multiple Choice

3. Naturalistic epistemology primarily relies on which type of judgment?
 - a. Rational •
 - b. Revelatory
 - c. Empirical •
 - d. Intuitive
4. According to Islamic epistemology, which sources of knowledge are utilized?
 - a. Only empirical
 - b. Only rational and revelatory
 - c. Rational, revelatory, and empirical •
 - d. Only revelatory
5. Which of the following best describes the principle ideology of Naturalism?
 - a. Only supernatural forces operate in the universe.
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 - c. Knowledge comes primarily from revelation.
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 - a. Rational Judgment
 - b. Empirical Judgment
 - c. Revelatory Judgment •
 - d. Analytical Judgment

7. Karl Popper's falsification principle emphasizes:
 - a. The verification of scientific theories.
 - b. The importance of proving theories true.
 - c. *That theories should be disprovable to be scientific.* •
 - d. The reliance on revelatory knowledge in science.
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 - a. As empirical judgments.
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 - c. *As superstitious or non-scientific.* •
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9. What is a key difference between naturalistic and Islamic epistemologies in terms of knowledge sources?
 - a. Naturalistic epistemology relies only on revelation.
 - b. Islamic epistemology uses only empirical judgment.
 - c. *Naturalistic epistemology is based solely on empirical judgments.* •
 - d. Islamic epistemology does not allow for empirical observations.
10. In Islamic epistemology, how is the existence of God generally understood?
 - a. As an empirical judgment.
 - b. As a revelatory judgment.
 - c. *As a rational judgment.* •
 - d. As an intuitive feeling.
11. The concept of '*yaqīn*' (certainty) in Islamic epistemology implies that:
 - a. Knowledge is always probabilistic.
 - b. Empirical evidence is the only source of certainty.
 - c. *Some knowledge can be known with absolute certainty.* •
 - d. Revelatory knowledge is always uncertain.

Section 3: Short Answer

12. Define 'empirical judgment' and provide an example.
Empirical judgment is a type of judgment based on information gained through the five senses. Example: Observing and concluding that water boils at 100°C at sea level.
13. Explain Karl Popper's falsification principle in your own words.

Popper's falsification principle asserts that for a theory to be considered scientific, it must be possible to prove it false. It emphasizes the importance of disproving hypotheses rather than just seeking to confirm them.

14. Discuss the difference between naturalistic and Islamic epistemologies and their approach to understanding the concept of God's existence.

Naturalistic epistemology confines knowledge to empirical judgments and denies the supernatural, thus generally rejecting the concept of God's existence as it cannot be empirically proven. In contrast, Islamic epistemology incorporates rational, revelatory, and empirical judgments, allowing for the acceptance of God's existence as a rational judgment supported by philosophical arguments, such as the Contingency Argument, and revelatory evidence from religious texts.

Fill in the Blank:

15. In Islamic epistemology, '_____' refers to knowledge gained from Allah SWT and His Messenger. **Answer: Revelatory judgment**
16. Karl Popper's approach to scientific theories is that they should always be _____. **Answer: Falsifiable**

UNIT 2:

What is the Origin of Humankind?

Evolution and God's Special Creation

Lessons:

Lesson 1: Can be used as follow-up material

Lesson 2: Can be used to supplement as information is taught

Lesson 3: Can be used as background information for teachers, to equip and/or prepare the teacher for content that is being taught

Unit 2: What is the Origin of Humankind? Evolution and God's Special Creation

- Unit 2 Presentation Slide Deck (Scan QR code below to view)
- Lecture Video (Seminar 1) (Scan QR code to below view)

† Lesson 1: The Islamic Narrative of Creation

- Activity - Entry and Exit Ticket
- Supplemental Material - Pre-historic Timeline
- Assessment (Student's Edition & Teacher's Edition)

† Lesson 2, Part 1: The Science of Evolution

- Assessment (Student's Edition & Teacher's Edition)

† Lesson 2, Part 2: The Science of Evolution Evidence and Acceptance

- Supplemental Material - Comprehending "Human Exceptionalism"
- Assessment (Student's Edition & Teacher's Edition)



UNIT 2: WHAT IS THE ORIGIN OF HUMANKIND?
EVOLUTION AND GOD’S SPECIAL CREATION**Lesson 1 - The Islamic Narrative of Creation****NGSS Instructional Outcomes**

Next Generation Science Standards

HS-LS4-1: Communicate scientific information that common ancestry and biological evolution are supported by multiple lines of empirical evidence.

HS-LS4-2: Construct an argument supported by empirical evidence that changes to physical or biological components are caused by environmental factors.

HS-LS4-5: Evaluate the evidence supporting claims that changes in environmental conditions may result in changes in trait is of a population over successive generations.

**CCSS Instructional Outcomes**

Common Core State Standards

CCSS English Language Arts Standards for High School -

CCSS.ELA-LITERACY.RST.11-12.7: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.

CCSS.ELA-LITERACY.WHST.11-12.9: Draw evidence from informational texts to support analysis, reflection, and research.

Content Learning Outcomes:

1. Demonstrate the Islamic narrative of human creation.

2. Describe and explain the theological account of non-humans and humans

Materials:

- Presentation Slides
- Triple-Entry Vocabulary Journal (Student Responsibility)
- Entry and Exit Tickets - or 3"x5" index cards or online survey tool (Slido or Nearpod etc..)
- Pre-historic Time (Supplemental Material)
- Assessment Questions

Instruction/Teacher Facilitation:

SLIDE 4

- † Two key issues discussed in the concept of evolution are, the age of the earth (a time factor) and, the origin of man.
- † Entry tickets (see page 99) [This activity focuses students' attention and asks students to recall background knowledge relevant to the lesson.]
 - On the entry ticket (Formal entry ticket, index card or through an online survey tool), ask students to respond to the question: "Based on your prior knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?"
 - If using index cards as the entry ticket, the teacher can collect them or allow students to keep them until the end of class so that the back can be used as the exit ticket. If using an online survey tool, close the survey or stop accepting any more responses (re-open for exit ticket question).

SLIDE 5

- † Of the two key issues, let us first look at time:
 - The reason time is a major factor in evolutionary concepts is because, in order for evolution to take place, immensely long periods of geological time are necessary to account for the possibility of small changes/adaptations to occur, resulting slowly into major changes.
 - Within this concept of an extremely long stretch of time, we can start with the age of the earth. Let us look at the Qur'an and see what is the revelatory evidence for this:

Verily your Lord is Allah, who created the heavens and the earth in six days [Sūrah al-A'rāf, 8:54] What does “six days” mean in this verse? This leads to the question about the cosmos and how we understand time.

SLIDE 6

- † How old is the cosmos then? (“cosmos” includes the sky, solar system, and the earth)
 - Option 1: Day (al-yawm) in Arabic means from dawn to dusk. Thus, day in this verse can mean what immediately comes to one’s mind: like Saturday, Sunday, Monday; a 24-hour period.
 - Option 2: Day in the Qur’an, at times, refers to 1,000 years, “a single day in your Lord’s sight is like a thousand years of what you count” [Sūrah al-Ḥajj, 22:47] or more “The angels and the Spirit [i.e., Gabriel] will ascend to Him during a Day, the extent of which is fifty thousand years.” [Sūrah al-Ma’ārij, 70:4] So a “day” can be anywhere from 1,000 years to 50,000 years.
 - Option 3: “Day” in Arabic also refers to time periods (al- awqāt). “Six days” in the verse can refer to six periods of time. [al-Bayḍāwī] - could be similar to the concept of deep time.
- † **Biology Connection** - prehistoric periods of time: for example, we divide it into eons, eras, periods, or epochs. This can help students understand the concept of “periods of time” or give them a frame of reference. [Refer to Pre-historic Time - Supplemental Material on page 91 for more details.]
- † When or how long ago exactly the creation of Adam falls into this time spectrum and is up for speculation and interpretation.
- † Connect back to the Spectrum of Certainty and explain that this information is all *zannī*, probabilistic in nature, and not certain.

SLIDE 7

- † Let us now look at the question of Origin of Man
 - Begin by asking students how human beings are addressed in the Qur’an: What names/words did Allah SWT use to speak about or call upon human beings?

SLIDE 8

1. *Insān*
2. *Bashar*
3. *Banū Adam*

4. *An-Nās*

† Let us now analyze each of these to understand the human being better and why we are called as such.

† *Insān* - refers to our rational soul operating through it is cognitive and active powers.

- A term that refers to both males and females and can apply to both equally.
- Lexically, a term that stems from *nisyaan*, which means “to forget” or “forgetfulness.”

† *Bashar* - refers to man with his bodily aspect, an anatomical being.

- A human’s biological nature, physical life, shape, and construction.
- Lexically, the term *bashar* signifies the surface of the skin upon which hair grows [Connect this to how we classify/define mammals in biology: a warm-blooded vertebrate animal that is distinguished by the possession of hair or fur. Again, pointing to the difference between animals and humans, even the way the hair grows is unique in the fact that humans have concentrated hair growth like on their head and certain areas more than the rest of the body, whereas animals have full body hair/fur].
- In his biological nature, man is different from animals. Humans have the ability for complex thoughts and are motivated by their instincts, intellect, and logic. Animals are simply motivated by their instincts. Human beings are bipedal, which means that they walk on two legs (intellectually, spiritually, and physically different).

SLIDE 9

† *Banū Adam* - Synonymous with *An-Nās* (3 different uses in the Qur’an)

- Refers to mankind, including Adam (A) and Hawwā’ (A), and all male and female progeny.
- Refers to just the progeny of Adam (A) and Hawwā’ (A); this usage includes all of mankind, except Adam (A) and Hawwā’ (A).
- Refers to only the male progeny of Adam (A) -> this is the strict literal usage of the term.

[These 4 terms have been used in the Qur’an, including An-Nās.]

† *Al-Hayawān al-Nātiq* - (logical/rational term) Muslim scholars define a human being as a rational animal.

- ***Al-hayawān*** - linguistically meaning “living being” - a being that has a body, grows etc. [This can be connected to the definition of “life” from a biological standpoint. In biology, a living being or life must possess 7 properties: 1. Order, 2. Reproduction, 3. Growth and development, 4. Energy processing, 5. Regulation, 6. Response to the environment, 7. Evolutionary adaptation].
- ***An-Nātiq*** - literally means to articulate, “speaking,” also defined as rational because one can only articulate if one possesses rational ability (aql). Speaking denotes specifically the ability to name something and have names for things.
- Thus, a human is a living being that speaks; the only living being that speaks (which is what distinguishes us from other animals). As Allah SWT mentions in (Sūrah Ar-Raḥmān, 55:3-4), that He “Created human beings” using the word *Insān* here, and “taught them speech.”

SLIDE 10

- † Along the same lines, let us look at what Allah SWT mentions in the Qur’an about the material/physical creation of humans and the different stages of creation.
 - “Who has perfected everything He created. And He originated the creation of humankind from moist clay.” [Surāh As-Sajdah, 32:7]
 - “So ask them O Prophet, which is harder to create: them or other marvels of Our creation? Indeed, We created them from a sticky/clinging clay.” [Surāh As-Saffāt: Verse 11]
 - “Indeed, We created man of a finished blank of hardened clay made of black mud.” [Surāh Al-Ḥijr, 15:26]
 - “He created humankind from ‘sounding’ hard clay like baked pottery.” [Sūrah Ar-Raḥmān, 55:14]
 - All of these examples talk about the ***bashari***/physical aspect of human beings.

SLIDE 11

- † These verses describe the general creation and development of human beings. What about the first human being? Who is the father of mankind and how was he created? The creation of the first human being, Adam (A), is notably different.
 - ع “Then people will come to Adam and say, ‘You are the father of mankind (***Abul-bashar***/أَبُو الْبَشَرِ), Allah created you with His own hand and breathed into you of His spirit...” (Sahih Muslim)
 - Allah SWT Himself created Adam (A), an honor given only

to Adam (A). [Background of Hadīth: This hadīth is about the Day of Resurrection when all people would gather and wait for Judgment Day to begin, and so the people will go to each Prophet to try to find someone who can intercede. And only Muhammad, Rasullullah ﷺ would be able to do so].

SLIDE 12-13

- † “And [mention] when your Lord said to the angels, ‘Truly, I will create a man (*bashar*) from clay. So when I have completed him and breathed into him of My spirit, then fall prostrate to him.’ And the angels prostrated, one and all. Except Iblīs (Satan), who was too proud to, and disbelieved. He said to him, ‘O Iblīs/Satan, what prevented you from prostrating to what I have created with My two hands? Are you arrogant, or too exalted?’ He said, ‘I am better than he; You created me from fire and created him from clay’ (Sūrah Šād, 38:71-76). [Note: this is not to be understood in an anthropomorphic view of Allah SWT, but to signify that Allah SWT created Adam personally.]
- † Through revelatory evidence, we have established that the origin of man dates back to when Allah created Adam (A).

SLIDE 14

- † Doctrine Regarding Hawwā’ (A) - Adam (A) is the first human being and the first man. Let us look at the first woman.
 - “Then Iblīs was exiled from the Garden when he was cursed, and Adam was put to dwell in the Garden. He went around alone with no wife in whom he could find repose. Then he fell asleep and woke up to find a woman sitting beside his head whom God had created from his rib.”
 - “So he asked her: ‘Who are you?’ And she said: ‘A woman.’ He said: ‘Why are you created?’ She said: ‘So that you could find repose in me.’ Then the angels ask him, to see how much he knew: ‘What is her name, Adam?’ He said: ‘Hawwā’ They said: ‘Why is she called Hawwā?’ He said: ‘Because she was created from something living (*Haīy*).’ [*Ha-wa-ya* - to live]
 - “Then God said to him: ‘Adam, dwell you and your wife, in the Garden, and eat thereof whatever you desire.’” (Tafsīr at-Tabāri)
 - These narrations describe the creation of the first man and woman according to the Islamic scripture.

SLIDE 15

- † Putting the cosmos and the creation of human beings together, human beings have a very high status in the universe.

- In (Sūrah Al-Isrā, 17:70): “Indeed, We have dignified/honored the children of Adam, carried them on land and sea, granted them good and lawful provisions, and favored them far above many of Our creatures.”
- Therefore, humans are the most superior and honorable of all creation. Humans are said to occupy a higher status than angels because angels were created to obey Allah SWT and they have no option, while humans are granted free will to obey or disobey, so their free choice allows them to earn a rank higher than angels.

SLIDE 16-17

- † Were there living beings before the creation of humans?
 - In (Surāh Baqarah 2:30) the conversation between Allah SWT and the angels is mentioned: Remember when your Lord said to the angels, “I am going to place a successive human authority on earth.” They asked Allah SWT, “Will You place in it someone who will spread corruption there and shed blood while we glorify Your praises and proclaim Your holiness?” Allah SWT responded, “I know what you do not know.”

SLIDE 18

- † How did they know that this new creation, human beings, will shed blood and spread corruption?
 - Option 1 - God informed the angels that among the Children of Adam are those who will cause corruption and shed blood. (Tabāri mentions this in his tafsīr)
 - Option 2 - There were previous inhabitants on the Earth, namely jinnkind who caused corruption and shed blood. So the angels assumed that the humankind would act like jinns.

SLIDE 19

- † Did human beings evolve from prior living beings? Did the human form evolve? - Let us look at the revelatory text:
 - In Sūrah Al-Infīṭār, 82:7, Allah SWT states about Himself that He is the One: “Who created you, fashioned you, and perfected your design/balanced you.” - This refers to the physical form of the human being. This does not indicate that humans were created in an evolutionary manner, starting with a primitive form and then evolving into a more developed, perfect form.

Allah SWT is saying that from the beginning, human beings were designed in a perfect form.

- In Sūrah At-Tīn, 95:4, Allah SWT also mentions: Indeed, We created humans in the best form (fairest symmetry).” This reiterates the creation of human beings in *ahsan at-taqwīm*.

SLIDE 20

- Therefore, we can say that humans are created from the outset in the complete physical form and the best symmetrical form (*ahsan at-taqwīm*).
- Humans did not evolve over the course of time from another species. Humans are a living being distinct in essence from other living beings.

SLIDE 21

- Does man belong to the anthropological classification of Homo?

In terms of biological classification, we would say that humans do not belong to the anthropological classification of *homo (sapiens)*.

If we say that they are *homo sapiens*, then we are saying that they are related to *homo neanderthalensis*, and have a common ancestor, and when you go down they are related to chimpanzees through ancestry/family. This would commit us to a framework with many philosophical assumptions, including a relationship to animals/common ancestors and an evolutionary process, which goes against the Qur'anic account.

- The proof lies in the Qur'anic account of human creation, AND observable biological differences that are present.

✦ Exit ticket (see page 87): Using the formal exit ticket, or the other side of the “entry ticket” index card, or the online survey tool, have the students answer the following questions: [The concept of the exit ticket is to collect feedback on students’ understanding at the end of class and provide the students with an opportunity to reflect on what they have learned. This can be helpful in prompting students to synthesize and integrate the information gained during the class period.]

- “Now, based on your recently acquired knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?” and/

or “What questions do you still have about the concept of evolution in regards to human beings?”

SLIDE 22

- † Closing: Summarize the truth claims made in this lesson; state the doctrinal position in Islam in regard to humans and evolution. (This can be done by the teacher listing the following, or by having the students participate in developing these statements as the teacher writes them down for the class to see.)
1. Humans are the most superior and honorable of all creation.
 2. The human species is created from dust (*turāb*) and proliferated from the first human Adam (A).
 3. Prophet Adam (A) is the father of all humankind.
 4. Prophet Adam was created by Allah in paradise not on earth. (evolution takes place only on earth, not in the heavens.)
 5. There were other living beings before humans were created.
 6. Humans are created from the outset in the complete physical form and fairest symmetrical form (*ahsan at-taqwīm*). Humans did not evolve over the course of time from another species. Humans are a living being distinct in essence, not in terms of degree, from other living beings.
 7. Man does not belong to the anthropological classification of Homo.

SUPPLEMENTAL MATERIAL

Pre-historic Timeline Defined from an Evolutionary Biology Perspective

Prehistory is a very generalized term that one could use to define events that took place prior to the invention of writing, which describes a very massive period of time. For better comprehension, the history of the earth as a whole is divided into eons, which are divided into eras, which themselves can be divided into periods and furthermore into epochs.

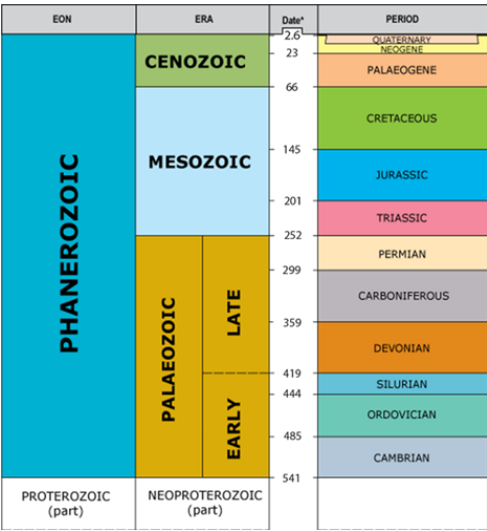
The history of the earth is divided into 4 eons.

- 1. Hadean from the formation of the earth 4.6 billion years ago to 4 billion years ago
- 2. Archean - lasted until 2.5 billion years ago, the crust of the earth cooled down and the first single-celled lifeforms started to appear.
- 3. Proterozoic from the end of the Archean until 541 million years ago and saw the rise of eukaryotes and even primitive multi-cellular life.
- 4. Phanerozoic lasts until this day and is divided into time periods

These eons are further divided into eras:

Based on The Geologic Time Scale 2012 by F M Gradstein, J G Ogg, M Schmitz and G Ogg (2012), with additions, image from the British Geological Survey

The Paleozoic is assumed to have started with the Cambrian Explosion, which saw a massive increase in the diversity of multi-celled lifeforms. The Paleozoic was when there was a rise of arthropods, fish, amphibians, and reptiles (including the ancestors to mammals, the synapsids). Again, each of these periods is further divided into multiple epochs.



The Mesozoic is known as the age of the dinosaurs and well known for it is 3 periods: the Triassic, the Jurassic, and the Cretaceous. The extinction of the non-avian dinosaurs 66 million years ago through a meteor impact signals the end of the Mesozoic and the start of the Cenozoic, the “Age of Mammals”.

These groupings are according to paleontologists’ distinctions due to their findings and their interpretation/understanding of such findings.

Unit 1: Lesson 1- Assessment

Section 1: Multiple Choice

1. According to the Qur'an, what are the possible interpretations of "day" in the context of the creation of the cosmos?
 - a. 24-hour period
 - b. 50,000 years
 - c. 1,000 years
 - d. All of the above
2. What distinguishes humans from other living beings, according to Islamic belief?
 - a. Rational soul
 - b. Ability to walk upright
 - c. Physical appearance
 - d. None of the above.

Section 2: Short Answer

3. Explain the following terms for human beings which are mentioned in the Qur'an, and what differentiates them from each other.
 - *Insān*
 - *Bashar*
 - *Banū Adam*
 - *An-Nās*
4. If we have unique terms for human beings to separate them from animals, why do we also call human beings *Al-Hayawān al-Nātiq*?
5. What is the Islamic perspective on human exceptionalism in relation to evolution? How does it differ from the concept of human evolution?
6. Discussion/Reflection: In a brief essay, discuss the implications of teaching about human origins and evolution from an Islamic

perspective. How can these beliefs be integrated with scientific concepts?

Critical Thinking and Application

7. Discuss the potential areas of compatibility and conflict between scientific theories of human evolution and religious beliefs, considering the information presented in the lesson.

8. In the context of biology, explain the term “common ancestry.” How does the concept of common ancestry relate to the Qur'anic account of the creation of Adam?

Unit 2: Lesson 1 - Assessment (Teacher's Edition)

Section 1: Multiple Choice

1. According to the Qur'an, what are the possible interpretations of "day" in the context of the creation of the cosmos?
 - a. 24-hour period
 - b. 50,000 years
 - c. 1,000 years
 - d. *All of the above •*
2. What distinguishes humans from other living beings, according to Islamic belief?
 - a. *Rational soul •*
 - b. Ability to walk upright
 - c. Physical appearance
 - d. None of the above.

Section 2: Short Answer

3. Explain the following terms for human beings which are mentioned in the Qur'an, and what differentiates them from each other.
 - *Insān*
 - *Bashar*
 - *Banū Adam*
 - *An-Nās*

Insān: This term primarily refers to the rational soul of human beings, highlighting their cognitive and active powers. It is a gender-neutral term, also derived from "nisyaan," meaning forgetfulness, pointing to the human trait of forgetting.

Bashar: This term emphasizes the physical or bodily aspect of human beings, their anatomical being. It signifies the surface of the skin and is related to how we classify mammals, marking a distinction between humans and animals based on physical and biological nature.

Banū Adam: This term directly translates to "Children of Adam," referring to all human progeny, including both men and women,

highlighting the shared lineage from the first humans, Adam and Hawwā' (Eve).

An-Nās: Used interchangeably with Banū Adam in certain contexts, it generally refers to mankind or people, underscoring the collective identity of humans.

The differentiation among these terms stems from the aspects they emphasize: "Insān" focuses on cognitive and spiritual trait is, "Bashar" on the physical, "Banū Adam" and "An-Nās" on lineage and collective humanity.

4. If we have unique terms for human beings to separate them from animals, why do we also call human beings *Al-Hayawān al-Nātiq*?

Humans are called "Al-Hayawān al-Nātiq" (the speaking or rational animal) to underscore their unique position as rational beings capable of speech and intellectual activities, setting them apart from other creatures. This term highlights the integration of both biological life (Al-Hayawaan) and the rational, speaking aspect (An-Naatiq), reflecting a comprehensive view of human beings in Islamic thought.

5. What is the Islamic perspective on human exceptionalism in relation to evolution? How does it differ from the concept of human evolution?

The Islamic perspective on human exceptionalism posit is that humans are a distinct creation of Allah SWT, not evolving from other species over time. This view is supported by Qur'anic texts stating that humans were created in the best form from the outset (Ahsan at-Taqweem) and do not share a common ancestor with other species, contradicting the concept of evolution that suggests humans evolved from other forms of life. The Islamic narrative asserts a special creation for humans, emphasizing their unique status and role in the universe.

6. Discussion/Reflection: In a brief essay, discuss the implications of teaching about human origins and evolution from an Islamic perspective. How can these beliefs be integrated with scientific concepts?

Answers will vary but the answer can include that teaching about human origins from an Islamic perspective alongside scientific concepts presents an opportunity to explore the diversity of thought on the origins of life and humanity. Integrating these beliefs with scientific concepts can encourage critical thinking and respect for different viewpoints. It allows students to see the convergence and

divergence between the Islamic narrative and scientific theories, fostering a more holistic understanding of human origins.

Critical Thinking and Application

7. Discuss the potential areas of compatibility and conflict between scientific theories of human evolution and religious beliefs, considering the information presented in the lesson.

Areas of compatibility might include the recognition of the complexity and sophistication of human life, and how both perspectives value the search for understanding our origins. Conflicts arise in the mechanism and timeline of human creation, with scientific theories suggesting a gradual evolution from common ancestors, while Islamic narrative posit is a special creation. Addressing these conflicts requires emphasizing the methodological differences between religious criteria and scientific inquiry, and the value of both in human understanding.

8. In the context of biology, explain the term “common ancestry.” How does the concept of common ancestry relate to the Qur'anic account of the creation of Adam?

In biology, “common ancestry” refers to the idea that all life forms on Earth share a common ancestor from which they have diverged over time through the process of evolution. This concept is a cornerstone of evolutionary theory, supported by evidence from various fields like genetics, paleontology, and comparative anatomy. The Qur'anic account of the creation of Adam suggests a direct creation by Allah, not through a process of evolution from pre-existing forms of life, presenting a distinct narrative from the biological concept of common ancestry.

Name: _____
Date: _____

Entry Ticket

Based on your prior knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?

Name: _____
Date: _____

Exit Ticket

Based on your recently acquired knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?

OR

What questions arise or do you still have about the concept of evolution in regards to human beings?

Name: _____
Date: _____

Entry Ticket

Based on your prior knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?

Name: _____
Date: _____

Exit Ticket

Based on your recently acquired knowledge, what is your understanding of the origin of man and how does that understanding correlate with the concept of evolution?

OR

What questions arise or do you still have about the concept of evolution in regards to human beings?

UNIT 2: WHAT IS THE ORIGIN OF HUMANKIND?

Lesson 2 - Part 1: The Science of Evolution

Key Principles

TIME LENGTH: 45-50 MIN



NGSS Instructional Outcomes

Next Generation Science Standards

Life Sciences:

HS-LS3 Heredity: Inheritance and Variation of Trait is: Understanding the role of DNA and genetics in evolution aligns with this standard.

HS-LS4 Biological Evolution: Unity and Diversity: This standard covers the understanding of natural selection, common ancestry, and biodiversity, all of which are key aspects of your lesson.

Science and Engineering Practices:

- † Analyzing and Interpreting Data: Students will analyze data and information about the principles of evolution and how they are understood in different contexts.
- † Engaging in Argument from Evidence: Discussing and evaluating different perspectives on evolution involves constructing arguments based on evidence.

Crosscutting Concepts:

- † Patterns: Observing patterns in the natural world that can be explained by the theory of evolution.
- † Cause and Effect: Understanding the mechanisms of evolution, like natural selection and genetic mutation.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards for Literacy:

CCSS.ELA-Literacy.RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, making connections between the theory of evolution and various Islamic perspectives.

CCSS.ELA-Literacy.RST.11-12.2: Determine the central ideas or conclusions of a text; provide an accurate summary that distinguishes among fact, reasoned judgment based on research, and speculation.

English Language Arts Standards for Speaking and Listening:

CCSS.ELA-Literacy.SL.11-12.1: Initiate and participate effectively in a range of collaborative discussions on the topic of evolution and its various interpretations, integrating and evaluating multiple sources of information.

Content Learning Outcomes:

1. Describe and explain the scientific account of Neo-Darwinian evolution.
2. Describe, categorize, and evaluate various Muslim responses to Neo-Darwinism.
3. Distinguish and evaluate the various kinds of conflicts (potential, apparent, and actual) between Islam and evolution

Materials:

- † Presentation Slides
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Pre-historic Time
- † Patterns of Pluralism and the Tree of Life Hypothesis (Article/Research Study)
- † Unit 2: Lesson 2 Assessment Questions

Instruction/Teacher Facilitation:

- † In the previous lesson, we discussed the two big factors in the concept of evolution; the age of the earth (time factor) and the origin of man from an Islamic perspective (theology-focused). We are going to build on that by looking at it from the perspective of science.
- † NOTE: Review the exit tickets from the last lesson and see what questions students still have and address them in this lesson.
- † Most of this lesson will be a review and a helpful summary for the students if the chapters regarding evolution have already been covered in Biology class. Therefore, throughout this lesson, students can be asked to recall the information being presented and then fill in the gaps with the information within this lesson. If the lessons of evolution have not been covered in Biology class, the teacher might need to go slowly and provide more details.

SLIDE 23

Let us now look at the common narrative of evolution and its key principles (within science/biology).

SLIDE 24

- † The concept of evolution was theorized by Charles Darwin, also known as the father of evolution. In general, on a voyage to South America, he went to the Galapagos Islands near Ecuador and studied finches primarily (among other things) and saw that there were many different types of finches, which were different based on which island he was on. Long story short, he came up with a few ideas to account for these differences and wrote his well-known work “The Origin of Species: by Means of Natural Selection.” Let us examine the key principles that he outlined.
- † Historically speaking, Darwin was not the first to come up with the idea or concept of evolution. Many others had this idea before him.
 - What was unique about Darwin’s presentation of this idea was that he came up with a process by which evolution takes place, a mechanism to try to explain the diversity of life seen on earth.
 - Using the process of induction, he was able to generalize and extrapolate a process for explaining evolution.
- † This lesson will focus on what we understand about evolution today, based on, and including, all the scientific advancements that we have had since then.

- Therefore, there will be differences between Darwin's concept of evolution (at his time) and the modern conception of evolution.

SLIDE 25

Evolution has three key principles:

1. Deep time (needed for gradualism)
 2. Common ancestry (or descent)
 3. Mechanisms (natural selection)
- † We will look at each one and elaborate on how it is defined in evolution.

SLIDE 26

Deep Time -The first of the principles of evolution:

- † At the time of Darwin, the idea of the age of the earth was just that the earth was really old. No one had a precise measurement, but people assumed that the earth was old (The earth was estimated to be around 6000 to 10000 years old according to biblical text calculations, considering the number of prophets mentioned and their assumed timeline.) So they estimated the age of earth to be between 6000, and 10,000, years old.
- † The reason that the age of the earth is important is because an extremely long period of time is required for the gradual changes seen in nature, according to the concept of evolution. Given the small changes over a long time, an extremely long period is needed to see major changes.

SLIDE 27

- † The estimate of the earth's age now is around 4.6 billion years old (much older than originally thought). [For a visual and more detailed explanation of how this is divided, view Prehistoric Timeline on page 91.]
- Calculations are based on rock samples and isotope measurements within them. The decay of long-lived radioactive isotopes of elements that occur naturally in rocks and minerals is examined. Scientists then compare the present concentration of a radioactive isotope to its decay product in a rock sample, like measuring the amount of cake left in the oven to determine how long it has been baking.

- Scientists use radioactive isotopes to determine the age of the Earth through a process called radiometric dating. One commonly used method is uranium-lead dating, which relies on the radioactive decay of uranium isotopes into lead. Radiometric dating is a technique that has provided valuable insights into Earth's history, helping us understand its age, geological processes, and the timing of major events in our planet. This is a tool in the field of geology and has greatly contributed to our knowledge of Earth's evolution.
- It has been determined that, being such a robust and well-established technique, it has only a 1% error range. To put it into context, of a determined number of 10 million years, this could mean either 9 million years or 11 million years.

SLIDE 28-29

- † This leads to the question, is this information about the age of the earth *qatī* or *zannī*?
 - Give students an opportunity to answer the question and give their reasons as to why they think it is either *qatī* or *zannī*.
 - It would be *zannī* still, due to that 1% error. Remember, *qatī* is only 100% certainty, no doubt whatsoever.
- † For more information, read *The Age of the Earth*, by G. Brent Dalrymple (1991).

SLIDE 30

Common Ancestry - second of the 3 key principles of evolution:

- † We are all familiar with the concept of a family tree. A family tree allows us to see how different members of that family are related or connected, who the ancestors are, who the descendants are, i.e., how generations are linked together.

SLIDE 31

- † Similarly, biology takes this same concept and applies it to an entire species. The theory of evolution seeks to explain that all biological life is connected over a long period of time, which defines this concept of common ancestry.
- † This is represented and examined through a Phylogenetic Tree of Life, which shows that all life came from the very same cell and continued to develop/adapt and branch off into different forms of life.

- † Common ancestry is explained by the branching and diversification of lineages as populations adapted primarily through natural selection.
- † This is not only a way to explain the diversity of life (of all living things), but it also is a way of understanding the unity of life (core requirements that all living things have in common; this helps explain both the diversity and unity of life. While living things come in many different forms, they all share common features. For example, all living things have cells with similar structures and functions, use DNA built in the same way, and are made from the same basic organic molecules).

SLIDE 32

- † An important distinction that needs to be made is between the origin of life versus the origin of species.
 - Origins of life (abiogenesis) refers to the very first life form (from which all life then originates)
 - Origins of species (evolution) how species evolve into other species.

It is interesting and important to note that Darwin never mentioned humans in his book when talking about the origin of species. He primarily focused on animals and insects. His book was called the “Origin of Species” not the “Origin of Life.”

SLIDE 33-35

- † On a phylogenetic tree of life, the organism or cell at the very bottom tip would depict the origin of life, and the rest of the tree depicts the origin of species. (picture from slides)

SLIDE 36

- † Evaluating if this principle is *qatī* or *zannī*
 - Until now, there is no adequate explanation of the origin of life abiogenesis from a scientific perspective.
 - Evolutionary biologists have:
 - Methodological disagreements about these phylogenetic trees (where they should branch, which species to be included, where or under which previous species etc.).

The branching patterns of phylogenetic trees often disagree even when they have been constructed using different portions of the *same* data. This phylogenetic discord can be explained by real differences in evolutionary process or history but also may be due simply to random chance or sampling error.

Questioned whether there is a single tree or multiple trees to accommodate all the disagreements and interpretations of the data.

Constantly revised placements of species in the light of new knowledge. Scientists cannot go back in time and investigate or analyze extinct species. Scientists can only use inferences based on current traces and project them onto the past.

- As a result, what we get from this is that inferences and projections are constantly changing due to new information being deciphered.
- This would mean that the principle of common ancestry is very *zannī* in terms of its truth seen through the constant adjustments and disagreements.

† For more information, scan the QR code to read at the “[Patterns of Pluralism and the Tree of Life Hypothesis](#).”

SLIDE 37

SLIDE 38

Mechanisms - the third key principle of evolution

SLIDE 39

† There are 2 key mechanisms in evolution:

- Random mutations
- Natural selection

SLIDE 40

† **Random mutations** are changes in the nucleotide sequence of DNA that occur without a pattern (i.e. randomly) and introduce new variations into a population.

- These genes are then combined or mixed on very probabilistic measures.



- After this combining/mixing of genes happens to produce offspring, we cannot absolutely determine which gene came from which parent. For example, if we are calculating the projectile of a tossed ball, we would be quite accurate based on the speed, it is angle, distance, etc. But this is not the case with genes. We cannot say with certainty which genetic makeup will be passed on to the offspring.
- Example: toss a coin and you can never know with absolute certainty that the coin will land on heads or tails.
- We consider this “random” only because we have not figured out what the particular mechanism is that determines such information.

SLIDE 41

† **Natural Selection** is an organism’s ability to survive in a specific environment, in other words, nature’s ability to select the ones that are the most capable to survive in that environment. Because of the organism's survival, they are able to live long enough to reproduce, passing on that successful trait to their offspring.

- Famous examples:

A longer neck allows animals to reach the leaves in trees to eat, and those who cannot reach it will have more competition with other organisms who eat food at a lower height. Therefore, giraffes survive, passing on their gene to their offspring which continue to reproduce due to the lack of competition and consistent food sources.

In a dark field, there are white mice and dark mice (black or brown). Because white mice are easily seen on dark terrain, they become easy targets for predators; predatory birds to be specific. This results in the dark mice surviving longer and reproducing and passing on that dark color gene. The dark mice are selected by nature to survive in this environment.

Note that if the terrain was light in color, the white mice would be selected for, and would survive, whereas the dark mice would be selected against and eaten much easier by predators. Therefore, a key aspect to remember is that the environment in which the organism lives plays a vital role in which the organism survives.

SLIDE 42

In summary, what is evolution?

† Evolution is characterized by 3 key principles:

1. Deep time: the earth is really, really old (4.6 billion years)
 2. Common ancestry: all biological life is interconnected through a long, historical lineage like a family tree.
 3. Mechanisms
 - a. Random mutations
 - b. Natural selection
- † Collectively, this is known as Neo-Darwinism.
- Neo-Darwinism is defined as a theory of evolution that represents a synthesis of Charles Darwin's theory in terms of natural selection and adds modern population genetics.
 - The key difference to note is that Darwinism was based on phenotypic differences passed down for speciation, but Neo-Darwinism has been updated to include genetics to explain these differences and the understanding that variant genes are inherited and passed down.

Biological Connections:

- This lesson can be connected to the chapter on concepts of evolution and biodiversity of life in Biology classes
- These concepts can also be connected to the definition of mammals, due to the concept of hayawān an-nātiq.
- This lesson can also be connected to cellular reproduction (mitosis and meiosis) and genetics (DNA and inheritance) in Biology classes, which includes genetic mutations (usually the 2nd unit, according to most Biology textbooks).

Unit 2: Lesson 2- Assessment

Part 1: Multiple-Choice Questions

Instructions: Choose the correct answer for each of the following questions.

1. What are the three key principles of evolution discussed in the lesson?
 - a. Evolution, Darwinism, Neo-Darwinism
 - b. Deep time, common ancestry, mechanisms •
 - c. Natural selection, random mutations, genetic variations
 - d. Origin of life, homology, fossil records
2. Why is the concept of “deep time” important in the theory of evolution?
 - a. It refers to the time needed for sudden changes in species.
 - b. It emphasizes the recent origin of the Earth.
 - c. It allows for gradual changes in species over an extended period of time.
 - d. It supports the idea that Earth is only a few thousand years old.
3. Which scientific technique is commonly used to determine the age of the Earth?
 - a. Carbon dating
 - b. Radiometric dating
 - c. Tree ring analysis
 - d. Archaeological studies
4. What is the main reason for considering the principle of common ancestry in the theory of evolution?
 - a. To emphasize the differences among species.
 - b. To prove that all species are completely independent.
 - c. To show that all biological life is interconnected through a historical lineage.
 - d. To promote the idea of spontaneous generation.

5. Human Exceptionalism in Cognitive Abilities: Which of the following best describes the cognitive aspect of human exceptionalism?

- a. The ability of humans to adapt physically to their environment
- b. The advanced cognitive and intellectual abilities of humans, such as complex thinking and problem-solving
- c. The physical strength of humans compared to other animals
- d. The ability of humans to fly

6. Moral and Ethical Reasoning: Human exceptionalism includes the development of:

- a. Only legal systems
- b. Complex ethical systems and the ability to ponder questions of right and wrong
- c. Basic instincts for survival
- d. The ability to hibernate

7. Divine Creation in Theological Human Exceptionalism: According to Islamic theology, Adam (A) and Hawwā' (A) were created:

- a. Through evolutionary processes
- b. By a random chance
- c. Directly by God, as a special creation distinct from random evolutionary processes
- d. As descendants of apes

8. Speech and Knowledge in Islam: Which Surāh explains that Allah SWT has taught humans eloquence and expression?

- a. Surāh Al-Baqarah
- b. Surāh An-Nis a
- c. Surāh Ar-Rahman
- d. Surāh Al-Fatiha

Part 2: Short Answer Questions

Instructions: Write a brief response to each of the following questions.

1. Explain why the age of the Earth is a critical factor in the theory of evolution. Provide an example of how a long period of time is essential for evolutionary changes.
2. Describe the principle of common ancestry and its role in understanding the unity and diversity of life. How is it represented through a Phylogenetic Tree of Life?

Part 3: Critical Thinking Question

Instructions: Write a well-structured essay response to the following question.

Neo-Darwinism is defined as a theory of evolution that combines Charles Darwin's natural selection theory with modern population genetics. Considering the information presented in the lesson, do you think Neo-Darwinism is a **qaṭ'ī** (certain) or **zannī** (probabilistic) explanation for the processes of evolution? Provide a well-reasoned argument for your answer, considering the evidence and challenges discussed.

OR

The knowledge presented suggests that Neo-Darwinism and its principles are **zannī**/probabilistic rather than **qaṭ'ī**/certain. Explain whether Neo-Darwinism provides a certain or probabilistic explanation for the processes of evolution. Support your argument with evidence and challenges that would result.

Unit 2: Lesson 2- Assessment (Teacher's Edition)

Part 1: Multiple-Choice Questions

Instructions: Choose the correct answer for each of the following questions.

1. What are the three key principles of evolution discussed in the lesson?
 - a. Evolution, Darwinism, Neo-Darwinism
 - b. *Deep time, common ancestry, mechanisms •*
 - c. Natural selection, random mutations, genetic variations
 - d. Origin of life, homology, fossil records
2. Why is the concept of “deep time” important in the theory of evolution?
 - a. It refers to the time needed for sudden changes in species.
 - b. It emphasizes the recent origin of the Earth.
 - c. *It allows for gradual changes in species over an extended period of time. •*
 - d. It supports the idea that Earth is only a few thousand years old.
3. Which scientific technique is commonly used to determine the age of the Earth?
 - a. Carbon dating
 - b. *Radiometric dating •*
 - c. Tree ring analysis
 - d. Archaeological studies
4. What is the main reason for considering the principle of common ancestry in the theory of evolution?
 - a. To emphasize the differences among species.
 - b. To prove that all species are completely independent.
 - c. *To show that all biological life is interconnected through a historical lineage. •*
 - d. To promote the idea of spontaneous generation.
5. Human Exceptionalism in Cognitive Abilities: Which of the following best describes the cognitive aspect of human exceptionalism?

- f. *The advanced cognitive and intellectual abilities of humans, such as complex thinking and problem-solving •*
 - g. The physical strength of humans compared to other animals
 - h. The ability of humans to fly
6. Moral and Ethical Reasoning: Human exceptionalism includes the development of :
- i. Only legal systems
 - j. *Complex ethical systems and the ability to ponder questions of right and wrong •*
 - k. Basic instincts for survival
 - l. The ability to hibernate
7. Divine Creation in Theological Human Exceptionalism: According to Islamic theology, Adam (A) and Hawwā' (A) were created:
- m. Through evolutionary processes
 - n. By a random chance
 - o. *Directly by God, as a special creation distinct from random evolutionary processes •*
 - p. As descendants of apes
8. Speech and Knowledge in Islam: Which Surāh explains that Allah SWT has taught humans eloquence and expression?
- q. Surāh Al-Baqarah
 - r. Surāh An-Nis a
 - s. *Surāh Ar-Rahman*
 - t. Surāh Al-Fatiha

Part 2: Short Answer Questions

Instructions: Write a brief response to each of the following questions.

9. Explain why the age of the Earth is a critical factor in the theory of evolution. Provide an example of how a long period of time is essential for evolutionary changes.

A: The reason time is a major factor in evolutionary concepts is because, in order for evolution to take place, immensely long periods of geological time are necessary to account for the possibility of small changes/adaptations to occur, resulting slowly into major changes. Without a long period of time, the changes would not be noticeable enough unless there was a major event that caused changes immediately. Even

changes within species occur over a few generations, which is again an extended period of time.

10. Describe the principle of common ancestry and its role in understanding the unity and diversity of life. How is it represented through a Phylogenetic Tree of Life?

A: The Phylogenetic Tree of Life shows that all life came from the very same cell and continued to develop/adapt and branch off into different forms of life. Common ancestry is explained by the branching and diversification of lineages as populations adapted (primarily through natural selection). This not only is a way to explain the diversity of life (of all living things), but it also is a way of understanding the unity of life (core requirements that all living things have in common; cell structures and mechanisms, all have DNA which is constructed the same, basic elements that they are constructed from are the same/organic molecules etc.).

Part 3: Critical Thinking Question

Instructions: Write a well-structured essay response to the following question.

Neo-Darwinism is defined as a theory of evolution that combines Charles Darwin's natural selection theory with modern population genetics. Considering the information presented in the lesson, do you think Neo-Darwinism is a **qatī** (certain) or **zannī** (probabilistic) explanation for the processes of evolution? Provide a well-reasoned argument for your answer, considering the evidence and challenges discussed.

OR

The knowledge presented suggests that Neo-Darwinism and its principles are **zannī**/probabilistic rather than **qatī**/certain. Explain whether Neo-Darwinism provides a certain or probabilistic explanation for the processes of evolution. Support your argument with evidence and challenges that would result.

A: Answer will vary, but should include key points such as Neo-Darwinism is zannī due to the probabilistic nature of evolutionary arguments and its processes. Scientists cannot go back in time and investigate or analyze extinct species, and then measure accurately, or do experiments in a lab. Scientists have to use inferences based on current traces and project them onto the past. As a result, what we get from this is that inferences and projections are constantly changing due to new information being deciphered. This would mean that the principle of common ancestry is zannī in terms of it is truth seen through the constant adjustments and dīṣāgreements. And since there is no qatī information or source of knowledge on the processes of evolution, by default, it will be zannī.

- *Evolutionary biologists have methodological disagreements about these phylogenetic trees (where they should branch, which species to be included where or under which previous species etc.). The branching patterns of phylogenetic trees of ten dīśāgree even when they have been constructed using different portions of the same data. This phylogenetic discord (incongruence) can be explained by real differences in evolutionary process or history but also may be due simply to random chance or sampling error. Some evolutionary biologists even question whether there is a single tree or multiple trees to accommodate all the dīśāgreements and interpretations of the data. Therefore, scientists are constantly revising the placement of species in the light of new knowledge.*

This assessment evaluates students' knowledge of evolution's key principles, their ability to apply critical thinking skills to scientific concepts, and their capacity to express their thoughts coherently.

Unit: 2
Lesson: 2
Part: 2

Time
Length:
45–50 min

UNIT 2 EVOLUTION AND GOD’S SPECIAL CREATION

Lesson 2 - Part 2: The Science of Evolution Evidence and Acceptance



NGSS Instructional Outcomes

Next Generation Science Standards

Life Sciences:

HS-LS4 Biological Evolution: Unity and Diversity: This standard addresses understanding the evidence for evolution, the process of natural selection, and biological diversity, which are key aspects of your lesson.

Science and Engineering Practices:

- † Analyzing and Interpreting Data: Students engage in analyzing the fossil record, homology, and genetic evidence to understand the evolutionary theory.
- † Engaging in Argument from Evidence: The lesson includes evaluating and discussing the evidence for and against Neo-Darwinism and the implications for Islamic viewpoints.

Crosscutting Concepts:

- † Patterns: Identifying patterns in biological evidence that support the theory of evolution.
- † Cause and Effect: Understanding how genetic variations and environmental factors contribute to evolution through natural selection.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards for Literacy:

CCSS.ELA-Literacy.RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, including discussions on evolution and its scientific basis.

CCSS.ELA-Literacy.RST.11-12.9: Compare and contrast findings presented in a text to those from other sources, including determining whether the findings support or contradict previous explanations or accounts.

English Language Arts Standards for Speaking and Listening:

CCSS.ELA-Literacy.SL.11-12.1: Initiate and participate effectively in a range of collaborative discussions on evolution, integrating diverse perspectives and responding thoughtfully to different viewpoints.

Content Learning Outcomes:

1. Describe and explain the scientific account of Neo-Darwinian evolution.
2. Describe, categorize, and evaluate various Muslim responses to Neo-Darwinism.
3. Distinguish and evaluate the various kinds of conflicts (potential, apparent, and actual) between Islam and evolution.

Materials:

- † Presentation Slides
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Pre-historic Time Supplemental Material
- † Article: [Does evolutionary theory need a rethink?](#)
- † Comprehending “Human Exceptionalism” Supplemental Material
- † Microevolution vs Macroevolution Resource Material
- † Unit 2: Lesson 2 Assessment Questions

Instruction/Teacher Facilitation:

- † In the previous lessons, we discussed the two big factors in the concept of evolution; the age of the earth (time factor) and the origin of man, from an Islamic/theological perspective. Then we shifted gears and looked at evolution from a scientific perspective by studying the key principles of evolution.
- † Now that we have defined the concept of evolution, particularly Neo-Darwinism, and looked at its key principles, let us look at the evidence presented in favor of evolution.

SLIDE 43

When examining Neo-Darwinism through an Islamic lens, we would ask: Is Neo-Darwinism *qatī* or *zannī*? In order to do that, we have to first look at the data or evidence.

SLIDE 44

Evidence for the Theory of Evolution is primarily derived from fossil records, homology and genetics.

SLIDE 45-46

- † **Fossil records:** Fossil evidence provides a record of how creatures evolved and how this process can be represented by a 'tree of life', showing that all species are related to each other. These fossil records provide snapshots of the past which are then assembled together to illustrate a wide view of evolutionary change over the past 3.5 billion years (based on the oldest fossil uncovered).

SLIDE 47

- † **Homology:** Homology refers to the similarity of the structure, physiology, or development of different species of organisms.
 - A common example of homologous structures is the forelimbs of vertebrates, where the wings of bats and birds, the arms of primates, and the front flippers of whales, (along with the forelegs of four-legged vertebrates like dogs and crocodiles) are all derived from the same ancestral tetrapod structure.

SLIDE 48-49

Some homologous structures can be seen only in embryo development. For example, all vertebrate embryos, from humans to chickens to fish, have a tail during early development, even if that tail does not appear in the fully developed organism.

SLIDE 50

- **Genetics:** Genetic variations that alter gene activities or protein functions can introduce different trait in an organism. If a trait is advantageous and helps the individual survive and reproduce, the genetic variation is more likely to be passed to the next generation. Examining the genetics reveals similarities within species and across various species.

Genetics allows for better placement on phylogenetic trees and homology as well.

When genetic changes occur, those changes carry on in their descendants, and only descendants can inherit those changed genes. Working backward, geneticists track those genes to early common ancestors.

SLIDE 51

[Genetic Video DNA Evidence](#)

SLIDE 52

The main question, or concluding question, then is whether Neo-Darwinism is *qatī* or *zannī*?

- † As mentioned earlier, fossil records are only snapshots and they are assembled together by researchers based on their own perspectives and interpretations of the raw data. [That does not necessarily mean that that is how it actually occurred; they are educated assumptions.]
- † Evolutionary biologists are still divided over the processes that actually take place.

Homology is only based on seeing similarities which can be seen through the fact that the source of all these organisms is the same Allah SWT. So it makes sense to see unity in living beings as well as diversity.

Activity: Have students read the article: Does evolutionary theory need a rethink? (Scan QR code to read)

- † Students should be instructed to read the article looking for proofs for Neo-Darwinism and proofs against Neo-Darwinism (or proof that it needs to be revised).
- † This will help students to sift through information and research to determine if this is a *zannī* issue. (For more explanation of those who argue that Neo-Darwinism needs to be revised, scan the QR code to view [Islam and evolution with Professor Shoaib Ahmed Malik](#) at time stamp 10:51.)



SLIDE 52

We can conclude that Neo-Darwinism and its principles are *zannī*/ probabilistic and NOT *qatī*/ certain.

- † Researchers are divided over what processes should be considered fundamental.
- † Extended Evolutionary Synthesis: This is an umbrella term for a set of contemporary theories that propose modifications or extensions to Neo-Darwinism. It includes ideas related to epigenetics, developmental biology, and niche construction, which can influence the course of evolution.
- † There are numerous arguments regarding the exact mechanisms of evolution, and if the mechanisms are not certain, then the theory as a whole is not certain either.

SLIDE 53

Conclusion: What can we accept?

- † We would need some *qatī* knowledge or criteria to be able to decide; only through revelatory judgments, we would be able to come to a clear conclusion.
- † If we do not find any clear verses or hadīth regarding these topics, we would then need to make sure that it does not go against what IS mentioned.
 - The concept of *insān* is NOT the same as the concept of homo-sapiens. The distinctions of humans and animals are evident.
 - The revelatory sources present a clear difference. (Hayawān vs Haywaan an-nātiq)
 - Question: What are the philosophical assumptions being made if we do lump them into the same category?
 - Looking at the Ancestral Trees and how and where the various species branch off, we can have two possible revisions based on revelatory evidence and the lack of revelatory evidence (revelation is silent about it) [about 2 million years ago]:

SLIDE 54

- Human Exceptionalism: an isolated species, no evolutionary connection
 - This concept generally refers to the belief that humans are fundamentally different from and superior to other animals, owing to unique qualities such as rationality, morality, language, or a soul.

SLIDE 55

- Adamic Exceptionalism: maintains Adam (A) (and Hawwā' (A)) as direct divine creation, but postulates that their descendant humans could have interbred with other hominids (who were already present on earth resulting from the evolutionary process).
- † Use [Comprehending "Human Exceptionalism"](#) Supplemental Material on page 126 for further information and discussion.

SLIDE 56

SLIDE 57

Let us look at where these principles of evolution intersect with what we believe to be true as Muslims:

- † Q: Is the proposition 'the earth might be 4.6 billion years old' in conflict with specific doctrines of the Qur'an or Sunnah?
- † A: No conflict because no actual estimate is mentioned
- † Q: Is the proposition 'all biological life, including the human being, is interconnected through a long, historical lineage like a family tree' in conflict with specific doctrines of the Qur'an and Sunnah?
- † A: YES, it is in conflict because humans are an exception
- † Q: Is the proposition 'human beings, chimpanzees, and monkeys all have a common ancestor from which they evolved' in conflict with specific doctrines of the Qur'an or Sunnah?
- † A: YES, it is in conflict because Adam (A) was divinely created, not "evolved"
- † As we learned, there are clear Qur'anic statements that Adam (A) was a new and unique creation and the original human being, which is why he is recognized as the father of mankind.
- † These points show that the theory of evolution is a demonstration of the interpretive aspect of science; human interpretation of data (not statements of truth as we assume).
- † We need to continually look at how certain are the pieces of evidence and what assumptions are being made about them.

SLIDE 58

[Keynote for students who are still perplexed: have patience! We should be comfortable and patient with the idea of not having all the answers, we do not need to have an answer immediately either. This should be a general principle with how scientific projects work anyway, as it takes time to research, get data, test that data, compare that data etc. Now that we have established that the concept of evolution is zannī, and if one is distraught and would like to have some level of certainty, the only resort is looking at qat'ī knowledge, which comes from the Qur'an

and Sunnah.] [If discussions of microevolution vs macroevolution come up, because human beings do undergo evolution in the sense that they have been “changing” since the time of Adam (A) then this extra portion can be covered formally in class as well.]

Resource Material

Microevolution vs. Macroevolution:

Is Darwinian Evolution successful in explaining how life on earth evolved?

† Microevolution changes of populations over time:

- These occur within species where new attributes develop. Microevolution is well-established within the scientific realm.
- Example: Horses have different breeds due to their differences, seen from past horse population changes.
- Generally affects living beings (“living” in the scientific sense and the Islamic sense).

† Macroevolution:

- Occurs across species where one species entirely changes into another. Macroevolution is not well-established and still maintains a ***questionable stance in the realm of science***.
- Example: Horses evolving into something that is no longer considered a horse.
- Questions that remain:
 - Has this actually happened? Is it metaphysically possible?
 - Logically possible? Because even the evidence is not well-established and questionable. Evidence does not live up to scientific standards.
 - What convincing evidence is provided? Most of the evidence is not stable enough to consider.

Biological Connections:

- † This lesson can be connected to the chapter on concepts of evolution and biodiversity of life in Biology classes.
- † When discussing the last point about human classification, this can be connected to a taxonomy lesson, but show that human taxonomy under homo sapiens is an assumption being made by evolutionary theorists. And the statements from our revelatory text prove this. This can also be connected to the concept of ***qatī*** and ***zannī***, and human taxonomy

as classified in mainstream biology is ***zannī***, whereas the Islamic notion of human exceptionalism is ***qat'ī***.

SUPPLEMENTAL MATERIAL

Human Exceptionalism:

A loaded term that has implications in a theological sense as well as in an evolutionary/scientific perspective.

Epistemic Understanding of Human Exceptionalism:

Human exceptionalism is a concept that acknowledges the uniqueness of humans. It asserts that humans, as a species, possess certain characteristics or attributes that set them apart from other living organisms. Some key aspects of human exceptionalism include:

- † Cognitive and Intellectual Abilities: Human exceptionalism recognizes that humans have significantly advanced cognitive and intellectual abilities compared to other species. This includes complex thinking, problem-solving, language, and the development of advanced cultures and societies.
- † Moral and Ethical Reasoning: Humans possess and emphasize the development of moral and ethical reasoning, which has led to complex ethical systems and the ability to ponder upon questions of right and wrong.
- † Self-awareness and Consciousness: Humans possess a high level of self-awareness and consciousness, enabling them to reflect on their own existence, the nature of reality, and their place in the world.
- † Religious and Spiritual Beliefs: Many proponents of human exceptionalism argue that humans have a unique capacity for religious and spiritual beliefs, often resulting in the search for meaning and purpose in life.

Theological Understanding of Human Exceptionalism:

The theological perspective combines all of these key elements mentioned epistemically and adds on the fact that humans have been favored with divine guidance through human messengers who instruct moral and ethical reasoning privileged to human beings.

[Note: There is some overlap between humans and jinn in some of these key aspects, but because we do not have access to much knowledge, especially empirical knowledge about the jinn, we are not discussing them here and are focused on speaking of

exceptionalism in the context of humans versus other creation that we can observe.]

- † Divine Creation: "Special creation" (in the theological sense) is a concept rooted in religious traditions and it is based on the belief in the special creation of the first human, Adam (A), and subsequently the first woman, *Hawwa* (A), were created directly by God, as described in religious texts. This is clearly mentioned in the Qur'an 38:71-71, 75. [This creation event is seen as distinct from the natural processes of evolution.]
- † Best Form: *Waḥy* (revelation) defines the human being to be in the best form, proportionately designed, and in perfect measures. As mentioned in the Qur'an: "We have created humans in the best of forms" (Surāh At-Tīn 95: Verse 4). This best form places human beings on an exceptional level in comparison to other creations and living beings.
- † Speech: The ability of humans to communicate in a linguistic manner, vocally as well as through literature, is another unique quality. In Surāh Ar-Rahmān (55:2-3) Allah SWT explains that "He has created man. He has taught him eloquence (how to express himself)."
- † Knowledge: Connecting back to Adam (A) as the first of all human beings, in Surāh Al-Baqarah (2:31), Allah SWT says: "He taught Adam the names of all things, then He presented them to the angels and said, 'Tell Me the names of these, if what you say is true.'" This particular verse highlights the knowledge and wisdom granted to Adam (A) by Allah SWT directly. The angels, in contrast, were unable to provide the names, emphasizing the unique knowledge bestowed upon Adam (A), even above the angels.
- † Humanity's Special Relationship with God: Humans have a unique relationship with their Creator and are distinct from other creatures by way of what has been bestowed on them. Human beings have been given divine guidance via scriptures and prophets/messengers, characteristic of Divine Mercy. This ties further to human salvation and a return to their previous dwelling place (with Allah SWT in Jannah). This emphasizes the importance of moral and spiritual considerations in human existence. Human exceptionalism also refers to one's ability to receive knowledge of *Waḥy* (expanded source of knowledge) not given to other creations.
- † Human Responsibility: This exceptional status that humans have been given comes with a level of responsibility and authority in this world/earth.

- Human beings are bound by the Sharī'a and it is injunctions and have a responsibility to implement it, uphold it, and spread it.
- The earth has been designed to cater to our needs as humans, therefore, we have the right to consume what is needed. It is also an *amanā*, a trust, and therefore resources should be used according to the Sharī'a.
- Humans have been assigned the responsibility/obligation to uphold the rights of others and the rights of Allah SWT on this earth.

There is an understanding of different levels of exceptionalism even amongst humanity:

- † Exceptionalism of ALL Humans: Allah SWT says in the Qur'an (Surāh Al-Israa, 17:70). "And Indeed We have honored the children of Adam, and carried them on the land and sea, and granted them good and lawful provisions, and preferred/privileged them far above many of Our creatures." Islamic belief also stipulates humans as God's deputies (khalīfah) on earth. This is iterated in (Surāh Baqarah 2:30,) where Allah SWT states to the angels, "I am going to create a deputy/successive authority on the earth." From these verses, we see that human beings have been honored as well as given authority above other creations on this earth.
- † Exceptionalism of the Believer: From amongst the general collective of humans, there is a special hierarchy given to the believing people, particularly Muslims over the non-believers. Human exceptionalism is closely linked to religious beliefs about human salvation and the relationship between humanity and God. The choice to believe and actually believe in God is what elevates the status of human beings in the eyes of God. As mentioned in the Qur'an, Allah SWT states, "O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you (who has taqwā). Indeed, Allah is Knowing and Aware." Taqwā, God-consciousness, can only truly be achieved by a believer. Allah SWT further says in the Qur'an, "And it is He who made you the vicegerents of the earth and raised some of you in ranks over others, so that He may test you in what He has given you. Surely, your Lord is swift in punishing and - surely He is Most-Forgiving, Very-Merciful." (Surāh Al-An'am 6:165)
- † Prophetic Exceptionalism: From among the believers, a group is elevated, which are the prophets of God. There are specific aspects that distinguish Prophets in Islam as exceptional individuals chosen by God to fulfill the critical role of guiding humanity. Their

lives, teachings, and the divine support they received are central to Islamic belief and serve as a foundation for moral and spiritual guidance.

- **Divine Selection:** Prophets are chosen by God for their roles. The Qur'an emphasizes that Prophets are selected by God's will to deliver His message to humanity. Their leadership is divinely inspired, aiming to bring people closer to God and to establish societies based on justice and righteousness.
 - **Moral and Ethical Excellence:** Prophets are depicted as models of moral and ethical excellence. They are known for their honesty, integrity, patience, and trustworthiness. Their characters are meant to serve as examples for all people to follow. Islamic teachings assert that prophets are protected by God from committing major sins, especially those that could undermine their credibility and the divine message they carry. This concept, known as 'ismah (divine protection), ensures that Prophets maintain a high level of integrity and are reliable conveyors of God's message.
 - **Revelation Receivers:** Prophets are unique among humans in that they receive Waḥy (revelation) from God. These revelations, which come in the form of scriptures or divine instructions, are meant to guide humanity. The Qur'an itself is considered the final revelation, given to Prophet Muhammad ﷺ.
 - **Miracles:** Many prophets are associated with miracles, which serve as signs of their prophethood and the truth of their message. These miracles, granted by the will of God, are beyond the capability of ordinary humans. For example, Musa (A) parting the Red Sea (Surāh al-Shu'ara 26:63) and Īsā (A) healing the blind and the leper (Surāh Al-Imrān 3:49) are miracles attributed to them in the Qur'an.
 - **The Exceptional amongst the Exceptional:** There are five prophets that are recognized as "Possessors of Resolve and Steadfastness" or ulul azmi. They are Nūh (A), Ibrāhīm (A), Musa (A), Īsā (A) and Muhammad ﷺ; the most exceptional of them all being Muhammad ﷺ. The Qur'an describes the Prophet Muhammad ﷺ as "the most beautiful example" for those who hope for Allah and the Last Day (Surāh Al-Ahāb 33:21).
- † **Exceptionalism of the Last Prophet, Muhammad ﷺ:** From the special, elevated class of the prophets, last and final, the most elevated human being is the last and final Prophet, Muhammad ﷺ. There is unanimous agreement amongst Muslim scholars that the Prophet Muhammad ﷺ is the greatest creation of Allah

SWT, and no other created being has any status that is higher than his. In the effort to summarize the exceptionalism of the prophet ﷺ here are a few of the honors given uniquely to him: Allah SWT took him as a close friend (khalīl); He made him the Seal of His Messengers; He revealed the best of His Books to him, and made his message one that applies to both mankind and the jinn until the Day of Resurrection; He caused miracles to happen at his hand that superseded those of all the Prophets who came before him; he will be the leader of the sons of Adam (on the Day of Resurrection), the first one for whom the grave will be opened, and the first one to intercede and the first one whose intercession will be accepted; in his hand will be a banner of praise on the Day of Resurrection; he will be the first one to cross the sirāt (a bridge across Hell), the first one to knock at the gate of Paradise and the first one to enter it, amongst many other unique characteristics and miracles that are mentioned in the Qur'an and Sunnah. The fact that the Prophet ﷺ is a human being gives honor and elevation to the human race.

- † Exceptionalism of Islam: Of all the religions and ways of life, Islam is singled out as the exceptional and only true dīn and way of life. There is a particular appreciation of being Muslim and following all the Prophets up to the very last Prophet, Muhammad ﷺ - (Surāh Māidah 5:3) "This day I have perfected for you your religion and completed My favor upon you and have approved for you Islam as religion." Bestowing the perfected religion of Islam upon human beings is a completion of all the favors previously given to human beings by Allah SWT (as listed above).

[NOTE: Due to the multiple understandings and perspectives the term Human "Exceptionalism" can take on, we have opted to use the term "Human Uniqueness" for clarity when referring to the theological exceptionalism of human beings (in reference to Unit 6 lessons).]

Evolutionary/Biological Understanding of Human

Exceptionalism:

An evolutionary biologist would likely define human exceptionalism in terms of unique evolutionary developments that set humans apart from other species. This could include advanced cognitive abilities, complex language, culture, and social structures, as well as the use of tools and technology. From this perspective, human exceptionalism is not a statement of humans being "better" than other species, but rather an acknowledgment of the distinct

evolutionary path and capabilities that humans have developed over millions of years of evolution.

- † This runs against traditionally held Islamic beliefs, particularly the belief that the origins of humankind began with the miraculous creations of Adam (A) and Hawwā (A) by God.
- † In order to address this discrepancy, Muslim scholars and scientists have examined ways in which the divine creation of human beings can be juxtaposed into the traditional evolutionary perspective while drawing the red lines.
- † One such Muslim scientist is Dr. Shoaib Ahmed Malik, who argues that a theology-centric approach can assist in reducing tensions, thus facilitating the understanding of Islam and evolution. In his book, "[Islam and Evolution: Al-Ghazālī and the Modern Evolutionary Paradigm](#)," (Scan QR code to watch) Dr. Malik explores various aspects of the Islamic perspective on evolution. In this context, he discusses two concepts: Human exceptionalism and Adamic exceptionalism.



Human Exceptionalism vs Adamic Exceptionalism

Here the terms "Human Exceptionalism" vs "Adamic Exceptionalism" have very specific connotations in the discussion of evolution and Islam, and how (if at all) evolutionary processes apply to humans.

- † Human Exceptionalism: an isolated species, no evolutionary connection.
 - This concept generally refers to the belief that humans are fundamentally different from and superior to other animals, owing to unique qualities such as rationality, morality, language, or a soul.
 - In many religious and philosophical traditions, human exceptionalism is based on the idea that humans have a special place in the universe or a unique relationship with the divine.
 - Therefore, humans are an exception to evolutionary processes and are not part of the Phylogenetic Tree of Life, eliminating humans from the idea of common ancestry.
 - Scientists call this way of thinking about the human-nature relationship "human exceptionalism"— when people believe that they exist independently of the ecosystems they live in and draw a sharp line between themselves and what is considered nature
- † Adamic Exceptionalism: "Adamic Exceptionalism" is a term and concept originated with Dr. David Jalajel and developed further by Dr. Shoaib Malik. Adamic Exceptionalism holds that Adam (A)

and Hawwa (A) were directly created by God but their descendants have interbred with other hominins resulting from evolution. It maintains that while humans are not inherently exceptional, Adam was uniquely created and endowed with special qualities. Proponents of this concept use Qur'anic verses to support this distinction, emphasizing Adam's creation as the moment when unique human spiritual, moral, and intellectual capacities emerged.

- It is very important to note that Adamic exceptionalism is not substantiated by any revelatory evidence and is not supported by any classical authorities in the fields of tafsīr, hadīth, kalām, or even tasawwuf. Furthermore, there is scholarly consensus (ijma') that Adam (A) is the first human being. According to Dr. Malik, the idea of Adamic exceptionalism does not contradict revelatory evidence and there is room for this thought. He believes, since there is no direct evidence regarding it, we would have to adopt *tawaqquf* (which is suspending judgment on the matter until more substantial information is obtained).

In the book "Islam and Evolution," these concepts are discussed at length in relation to Islamic theology and how it intersects with modern evolutionary theory. Human exceptionalism might be contrasted with evolutionary perspectives that do not inherently set humans apart from other animals, while Adamic exceptionalism provides a way to integrate the specific Islamic creation narrative of Adam (A) into a broader acceptance of evolutionary processes.

For a quick review and explanation, scan the QR code to view: [Islam and Evolution with Professor Shoaib Ahmed Malik](#), starting from 24:08:

- † 24:58 Four Positions on evolution
- † 25:32 Creationism
- † 27:58 No Exceptions
- † 28:41 Human Exceptionalism
- † 30:06 At what time did Adam (A) exist?
- † 33:04 Academic Exceptionalism
- † 46:50 Qur'anic vs Scientific Perspective*



Unit 2: Lesson 2 - Assessment

Part 1: Multiple-Choice Questions

Instructions: Choose the correct answer for each of the following questions.

1. What are the three key principles of evolution discussed in the lesson?
 - a. Evolution, Darwinism, Neo-Darwinism
 - b. Deep time, common ancestry, mechanisms
 - c. Natural selection, random mutations, genetic variations
 - d. Origin of life, homology, fossil records
2. Why is the concept of “deep time” important in the theory of evolution?
 - a. It refers to the time needed for sudden changes in species.
 - b. It emphasizes the recent origin of the Earth.
 - c. It allows for gradual changes in species over an extended period of time
 - d. It supports the idea that Earth is only a few thousand years old.
3. Which scientific technique is commonly used to determine the age of the Earth?
 - a. Carbon dating
 - b. Radiometric dating
 - c. Tree ring analysis
 - d. Archaeological studies
4. What is the main reason for considering the principle of common ancestry in the theory of evolution?
 - a. To emphasize the differences among species.
 - b. To prove that all species are completely independent.
 - c. To show that all biological life is interconnected through a historical lineage
 - d. To promote the idea of spontaneous generation.

5. Human Exceptionalism in Cognitive Abilities: Which of the following best describes the cognitive aspect of human exceptionalism?
 - a. The ability of humans to adapt physically to their environment
 - b. The advanced cognitive and intellectual abilities of humans, such as complex thinking and problem-solving
 - c. The physical strength of humans compared to other animals
 - d. The ability of humans to fly
6. Moral and Ethical Reasoning: Human exceptionalism includes the development of :
 - a. Only legal systems
 - b. Complex ethical systems and the ability to ponder questions of right and wrong
 - c. Basic instincts for survival
 - d. The ability to hibernate
7. Divine Creation in Theological Human Exceptionalism: According to Islamic theology, Adam (A) and Hawwā' (A) were created:
 - a. Through evolutionary processes
 - b. By a random chance
 - c. Directly by God, as a special creation distinct from natural processes
 - d. As descendants of apes
8. Speech and Knowledge in Islam: Which Surāh explains that Allah SWT has taught humans eloquence and expression?
 - a. Surāh Al-Baqarah
 - b. Surāh An-Nisā
 - c. Surāh Ar-Rahmān
 - d. Surāh Al-Fātiha
9. Role of prophets in Human Exceptionalism: In Islamic theology, the role of prophets and messengers is primarily to:
 - a. Teach humans about technology
 - b. Guide humans in moral and ethical reasoning
 - c. Lead humans in battles
 - d. Advise on economic matters

Part 2: Short Answer Questions (5 points each)

Instructions: Write a brief response to each of the following questions.

10. Explain why the age of the Earth is a critical factor in the theory of evolution. Provide an example of how a long period of time is essential for evolutionary changes.
11. Describe the principle of common ancestry and its role in understanding the unity and diversity of life. How is it represented through a Phylogenetic Tree of Life?

Part 3: Critical Thinking Question

Instructions: Write a well-structured essay response to the following question.

Neo-Darwinism is defined as a theory of evolution that combines Charles Darwin's natural selection theory with modern population genetics. Considering the information presented in the lesson, do you think Neo-Darwinism is a *qaṭī* (certain) or *zannī* (probabilistic) explanation for the processes of evolution? Provide a well-reasoned argument for your answer, considering the evidence and challenges discussed.

OR

The knowledge presented suggests that Neo-Darwinism and its principles are *zannī*/probabilistic rather than *qaṭī*/certain. Explain whether Neo-Darwinism provides a certain or probabilistic explanation for the processes of evolution. Support your argument with evidence and challenges that would result.

Note: This assessment evaluates students' knowledge of evolution's key principles, their ability to apply critical thinking skills to scientific concepts, and their capacity to express their thoughts coherently.

Unit 2: Lesson 2- Assessment (Teacher's Edition)

Part 1: Multiple-Choice Questions

Instructions: Choose the correct answer for each of the following questions.

1. What are the three key principles of evolution discussed in the lesson?
 - a. Evolution, Darwinism, Neo-Darwinism
 - b. *Deep time, common ancestry, mechanisms •*
 - c. Natural selection, random mutations, genetic variations
 - d. Origin of life, homology, fossil records
2. Why is the concept of “deep time” important in the theory of evolution?
 - a. It refers to the time needed for sudden changes in species.
 - b. It emphasizes the recent origin of the Earth.
 - c. *It allows for gradual changes in species over an extended period of time •*
 - d. It supports the idea that Earth is only a few thousand years old.
3. Which scientific technique is commonly used to determine the age of the Earth?
 - a. Carbon dating
 - b. *Radiometric dating •*
 - c. Tree ring analysis
 - d. Archaeological studies
4. What is the main reason for considering the principle of common ancestry in the theory of evolution?
 - a. To emphasize the differences among species.
 - b. To prove that all species are completely independent.
 - c. *To show that all biological life is interconnected through a historical lineage •*
 - d. To promote the idea of spontaneous generation.

5. Human Exceptionalism in Cognitive Abilities: Which of the following best describes the cognitive aspect of human exceptionalism?
 - a. The ability of humans to adapt physically to their environment
 - b. *The advanced cognitive and intellectual abilities of humans, such as complex thinking and problem-solving •*
 - c. The physical strength of humans compared to other animals
 - d. The ability of humans to fly
6. Moral and Ethical Reasoning: Human exceptionalism includes the development of :
 - a. Only legal systems
 - b. *Complex ethical systems and the ability to ponder questions of right and wrong •*
 - c. Basic instincts for survival
 - d. The ability to hibernate
7. Divine Creation in Theological Human Exceptionalism: According to Islamic theology, Adam (A) and Hawwā' (A) were created:
 - a. Through evolutionary processes
 - b. By a random chance
 - c. *Directly by God, as a special creation distinct from natural processes •*
 - d. As descendants of apes
8. Speech and Knowledge in Islam: Which Surāh explains that Allah SWT has taught humans eloquence and expression?
 - a. Surāh Al-Baqarah
 - b. Surāh An-Nīsā
 - c. *Surāh Ar-Rahman •*
 - d. Surāh Al-Fatiha
9. Role of Prophets in Human Exceptionalism: In Islamic theology, the role of prophets and messengers is primarily to:
 - a. Teach humans about technology
 - b. *Guide humans in moral and ethical reasoning •*
 - c. Lead humans in battles
 - d. Advise on economic matters

Part 2: Short Answer Questions

Instructions: Write a brief response to each of the following questions.

10. Explain why the age of the Earth is a critical factor in the theory of evolution. Provide an example of how a long period of time is essential for evolutionary changes.

A: The reason time is a major factor in evolutionary concepts is because, in order for evolution to take place, immensely long periods of geological time are necessary to account for the possibility of small changes/adaptations to occur, resulting slowly into major changes. Without a long period of time, the changes would not be noticeable enough unless there was a major event that caused changes immediately. Even changes within species occur over a few generations, which is again an extended period of time.

†

11. Describe the principle of common ancestry and its role in understanding the unity and diversity of life. How is it represented through a Phylogenetic Tree of Life?

A: The Phylogenetic Tree of Life shows that all life came from the very same cell and continued to develop/adapt and branch off into different forms of life. Common ancestry is explained by the branching and diversification of lineages as populations adapted (primarily through natural selection). This not only is a way to explain the diversity of life (of all living things), but it also is a way of understanding the unity of life (core requirements that all living things have in common; cell structures and mechanisms, all have DNA which is constructed the same, basic elements that they are constructed from are the same/organic molecules etc..).

Part 3: Critical Thinking Question

Instructions: Write a well-structured essay response to the following question.

Neo-Darwinism is defined as a theory of evolution that combines Charles Darwin's natural selection theory with modern population genetics. Considering the information presented in the lesson, do you think Neo-Darwinism is a *qaṭʿī* (certain) or *zannī* (probabilistic) explanation for the processes of evolution? Provide a well-reasoned argument for your answer, considering the evidence and challenges discussed.

OR

The knowledge presented suggests that Neo-Darwinism and its principles are *zannī*/probabilistic rather than *qaṭʿī*/certain. Explain whether Neo-Darwinism provides a certain or probabilistic explanation for the processes of evolution. Support your argument with evidence and challenges that would result.

A: Answer will vary, but should include key points such as Neo-Darwinism is zannī due to the probabilistic nature of evolutionary arguments and its processes. Scientists cannot go back in time and investigate or analyze extinct species, and then measure accurately, or do experiments in a lab. Scientists have to use inferences based on current traces and project them onto the past. As a result, what we get from this is that inferences and projections are constantly changing due to new information being deciphered. This would mean that the principle of common ancestry is very zannī in terms of it is truth seen through the constant adjustments and dīṣāgreements. And since there is no qaṭʿī information or source of knowledge on the processes of evolution, by default, it will be zannī.

■ *Evolutionary biologists have methodological dīṣāgreements about these phylogenetic trees (where they should branch, which species to be included where or under which previous species etc.). The branching patterns of phylogenetic trees of ten dīṣāgree even when they have been constructed using different portions of the same data. This phylogenetic discord (incongruence) can be explained by real differences in evolutionary process or history but also may be due simply to random chance or sampling error. Some evolutionary biologists even question whether there is a single tree or multiple trees to accommodate all the dīṣāgreements and interpretations of the data. Therefore, scientists are constantly revising the placement of species in the light of new knowledge.*

This assessment evaluates students' knowledge of evolution's key principles, their ability to apply critical thinking skills to scientific concepts, and their capacity to express their thoughts coherently.

Unit 2: Evolution and God's Special Creation

Question Bank

How do we explain that about 95%-98% of genetic information is the same/shared between us human beings and chimpanzees ([as seen in this video](#)), in a way that does not conflict with Islamic teachings? DNA Evidence That Humans & Chimps Share A Common Ancestor: Endogenous Retroviruses

This answer will depend on whether you prefer Human or Adamic exceptionalism.

Adamic Exceptionalism and Genetic Similarities with Chimpanzees

The concept of Adamic Exceptionalism allows for a reconciliation between the scientific observation of genetic similarities and Islamic teachings. This perspective acknowledges the special, non-evolutionary creation of Adam A (and Hawwa A) by God, which is distinct from the creation of other beings. This unique creation event sets Adam A apart from the evolutionary processes that might apply to other forms of life, including the hominins that were present on Earth before or at the time of Adam A's creation. According to Adamic Exceptionalism, the genetic similarities between humans and chimpanzees can be understood in the following ways:

- **Shared Design Principles:** The genetic similarities reflect shared design principles employed by the Creator in various forms of life. Different creations might share certain physical laws or materials, but they might also share genetic sequences that serve similar biological functions.
- **Historical Interbreeding:** The concept allows for the possibility that descendants of Adam A could have interbred with other hominins. This interbreeding could have incorporated genetic material from these hominins into the human gene pool, thereby accounting for the genetic similarities observed between humans and other primates.
- **Divine Wisdom:** The genetic similarities might be seen as part of the divine wisdom in creation, serving purposes that we may not fully understand. This perspective does not diminish the unique status of Adam A and his direct creation by God but rather highlights the complexity and interconnectedness of God's creation.

- **Non-Evolutionary Creation of Adam A:** The unique creation of Adam A, as described in Islamic texts, suggests that the essential qualities that define human exceptionalism—such as spiritual, moral, and intellectual capacities—are not the products of evolutionary processes but are instead directly bestowed by God. This allows for a distinction between the physical body, which may share genetic material with other species, and the non-physical aspects of humanity, such as the soul, which are unique to humans.

Human Exceptionalism and Genetic Similarities with Chimpanzees

Under the premise of Human Exceptionalism, the genetic similarities between humans and chimpanzees might be interpreted through several lenses that do not conflict with the concept's core beliefs:

- **Convergent Design:** The similarities in genetic information could be seen as a result of a convergent design by the Creator, where similar genetic sequences serve similar biological functions across different species. This concept implies that the Creator used a common design for various life forms, resulting in genetic similarities, without implying a direct evolutionary lineage.
- **Functional Necessity:** The genetic similarities could also be understood as a reflection of the functional necessities of living organisms. Certain genes and genetic sequences may be fundamental to basic biological functions, such as cellular processes, metabolism, and reproduction, leading to similarities across species without implying evolutionary descent.
- **Distinctive Creation with Shared Elements:** In line with Human Exceptionalism, humans could be viewed as a distinct creation that, while sharing some material and biological elements with other creatures (as part of a unified design of life), are set apart by non-material qualities (such as the soul, moral reasoning, and intellectual capabilities) that are not reflected in genetic material and are not a product of evolutionary processes.
- **Limitations of Scientific Interpretation:** Proponents of Human Exceptionalism might argue that the interpretation of genetic similarities is limited by the current understanding of science, which is always subject to revision and refinement. They may contend that scientific findings do not encompass the entirety of human

existence and do not account for the non-physical aspects that confer human uniqueness.

Conclusion

The interpretation of the genetic similarities between humans and chimpanzees is deeply influenced by one's inclination towards Adamic Exceptionalism, which harmonizes these similarities with the divine narrative of human creation, or Human Exceptionalism, which emphasizes the transcendent qualities of humans beyond their biological makeup. Adamic Exceptionalism offers a theological lens, integrating scientific discoveries with the belief in special creation, thus maintaining the unique status of humans within Islamic thought without disregarding scientific evidence. On the other hand, Human Exceptionalism underscores the non-material aspects of humanity, such as spirituality and morality, viewing genetic similarities as mere reflections of shared biological functions rather than indications of common ancestry. This nuanced juxtaposition invites students to reflect on the complex relationship between faith and science, encouraging personal exploration of how these perspectives resonate with their understanding of human uniqueness and the broader existential questions about our place in the natural world. Ultimately, the choice between these perspectives is left to the reader, inviting a personal reflection on the interplay between faith, science, and the profound questions about what it means to be human. Each framework offers a pathway to integrate scientific knowledge with spiritual beliefs, highlighting the diverse ways in which humanity can understand its place in the vast tapestry of life.

UNIT 3:

What Does it Mean to be a Human Being?

Neuroscience, Artificial Intelligence and the Soul

Lessons:

Lesson 1: Islamic Concept of the Soul and Neuroscientific Reductionism

Lesson 2: Physicalism, Modern Science, and Consciousness

Lesson 3: Revelatory Insight into Enhancing Our Beings and Human Features

Unit 3: What Does it Mean to be a Human Being? Neuroscience, Artificial Intelligence and the Soul

- Lecture Video (Seminar 3) (Scan QR code below to view)
- Unit 3 Presentation Slide Deck (Scan QR code below to view)

† Lesson 1 - Part 1: Islamic Concept of the Soul and Neuroscientific Reductionism

- Supplemental Material - Science and Epistemology
- Assessment (Student's Edition & Teacher's Edition)

† Lesson 1 - Part 2: Physicalism, Modern Science, and Consciousness

- Activity - Mary's Room Video
- Assessment (Student's Edition & Teacher's Edition)

† Lesson 2: Artificial Intelligence

- Activity - Meet Sophia Video
- Activity - Turing Test Video
- Activity - How ChatGPT Works Video
- Activity - Artificial Intelligence and Personhood Video
- Assessment (Student's Edition & Teacher's Edition)



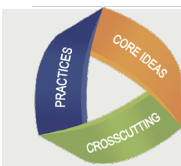
UNIT 3: WHAT DOES IT MEAN TO BE A HUMAN BEING?

Neuroscientific, Artificial Intelligence and the Soul

Lesson 1- Part 1: Islamic Concept of the Soul and Neuroscience Reductionism

Unit: 3
Lesson: 1
Part: 1

Time
Length:
45–50 min



NGSS Instructional Outcomes

Next Generation Science Standards

- † HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
- † (This standard aligns with the exploration of the soul and it is different stages of existence, including it is connection to the body.)
- † HS-PS2-6: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.
- † (This standard relates to the discussion of neuroscientific reductionism and the emphasis on the physical aspects of human existence, particularly the brain.)



CCSS Instructional Outcomes

Common Core State Standards

- † ELA-LITERACY.RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- † ELA-LITERACY.RI.11-12.8: Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning.

- † (Although not directly related, this standard emphasizes the evaluation of reasoning, which is a key aspect of the lesson when discussing challenges to the Islamic concept of human nature.)
- † ELA-LITERACY.W.11-12.1.B: Develop claim(s) and counterclaims fairly and thoroughly, supplying the most relevant evidence for each while pointing out the strengths and limitations of both in a manner that anticipates the audience’s knowledge level, concerns, values, and possible biases.

Content Learning Outcomes:

- † Describe the Islamic concept of the soul and personal identity.
- † Define consciousness and discuss how this experience cannot be reduced to physical processes.
- † Discuss what Neuroscientific leaves out about consciousness.
- † Expand conceptual vocabulary for relevant discussions at the junction of theology and bioscience.
- † Demonstrate how the Islamic view of the world and the soul provides a comprehensive worldview that is lacking in scientism.

Materials:

- † Presentation Slides: Slides 3–11
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Science and Epistemology (Supplemental Material)

Instruction/Teacher Facilitation:

- † In this unit, we will be discussing what it actually means to be human. Also, how “human” is defined and characterized by different ideological groups, particularly in Islamic theology versus science, and the new realm of artificial intelligence.

SLIDE 3

- † [There will be a lot of new vocabulary in this lesson for students to make note of, and they should be able to effectively define them in order to comprehend this nuanced discussion. Be sure to ask/ remind students to add key terms in their triple-entry journals.]

SLIDE 4

- † So the first question that we need to address is “What does it mean to be human?” And along with that comes by default, the connected question of “What is the purpose of life?”

- Looking at three viewpoints, from the perspective of Islam, from from the lens of neuroscience and finally how being human would even fit in with artificial intelligence, let us examine the concept of the soul (highlighting the potential conflict that exists between these fields and the Islamic concept of the soul).

Islam - What does it mean to be human? - To have a soul

What is the purpose of life? - To develop the soul

Neuroscientists - What does it mean to be human? -

To have a brain (to have just a physical body)

– What is the purpose of life? - ??? (We would not be able to derive a purpose of life from just a mere body deduction.)

Artificial Intelligence - What does it mean to be

human? - To act like a human

– What is the purpose of life? - ??? (No real purpose if AI is only here to mimic human behavior.)

SLIDE 5–6

- † In this lesson, we will focus on how Islam defines a human and how the purpose of a human being is then derived from that definition.

- According to Islamic doctrine, you are still a human even after you die. And if you are still human after you die, then what does it mean for you to be human?

Think about what we believe in Islam about our life and soul. We technically survive death; our soul survives because it moves on. Our journey does not end with death; we have an afterlife.

Personal identity is related to the soul

an identity that exists beyond this world and that carries through into the next life (not limited to the bodily identity).

Me/I - in order to talk about myself and my identity individually, there needs to be a “me” that exists (mental states).

We still continue to exist as human beings in the afterlife. The difference would be that, in the afterlife, we are a soul without a body.

SLIDE 7

- † We know that our soul goes through various stages (4 general stages)

1. Life of Souls - We were souls without bodies. **Revelatory Evidence:** "Remember when your Lord took out from the loins of the children of Adam their offspring and said, 'Am I not your Lord?' and they said, 'Yes indeed, we testify.' 'Now you have no right to say on Judgment Day, 'We were not aware of this.'" (Surāh Al-A'rāf 7:172)
2. This Life - Our souls were breathed into our bodies. **Revelatory Evidence:** "... then an angel is sent to it and it breathes the soul into it and it is commanded to write down four things ..." (Bukhari)
3. In the Grave - Our souls will separate from our bodies and our bodies will decay, as our soul moves on. **Revelatory Evidence:** "Every soul shall experience death." (Surāh Ali-Imraan 3:185) - here it says that every soul shall "experience" death, and in many other translations, it says shall "taste" death, so this shows that death is not the end, but a step in a continued process.
4. The Afterlife - Our souls will be reunited with our resurrected bodies. **Revelatory Evidence:** "... then it will be blown in again and we will suddenly stand up, looking." (Surah Az-Zumar, 39:68)

SLIDE 8

† Now that we have looked at the Islamic perspective and revelatory evidence for it, let us look at the **rational** evidence for the existence of the soul.

- We know we have a soul through introspection. (Introspection means to look inside the self or within yourself. Which is in contrast to empirical, which means to look outside of one's self.)
- That means that we can look inside ourselves and see that the thing that experiences cognition, pain, pleasure, happiness, sadness, humility, arrogance, gratitude, and ingratitude, is something other than our bodies.
- We are not exactly sure what the soul is, or where it is located, but we know it is there.

† Examining the revelatory and rational evidence, it seems clear that this would be an accepted view. Yet, that is not the case. There are challenges to the Islamic paradigm of a "human."

SLIDE 9

† Challenges to the Islamic Concept of Human Nature (Ontology):

- Neuroscientific view of Consciousness - with which we will discuss the following points:

- What is Consciousness?

- Neural Correlates of Consciousness

- Mary & Color Thought Experiment

- Artificial Intelligence - with which we will discuss the following points:

- What is Intelligence?

- Artificial Generalized Intelligence

- Chinese Room Thought Experiment

- The basic challenge or opposing premises are that:

- We are nothing but our brains

- Consciousness is an illusion

- Human life has no purpose

- Before we go further, let us define “ontology”

- † Ontology is the study of existence; it deals with the nature of “being” or the nature of the world.

SLIDE 10

- † **Group Activity:** The question then becomes, “What does the world consist of?” - Ask the students what they think the world is made of.

- Take an apple for example: How would I describe this apple to someone who has never seen or eaten an apple before?

- Modern science measures matter/physical qualities. Mathematics is the language of natural science.

- I could measure it is size, shape, mass, and volume. But an apple is not limited to those things.

- What about it is taste and smell? How would I describe that in quantitative terms?

- It has to be experienced for one to be able to fully grasp or comprehend an apple.

- The problem is that sensory qualities (known as qualia) cannot be quantified.

- The solution to this problem is that to describe the apple more completely, one has to move to the mind/soul to grasp it.

- The problem here is that science cannot explain the mind or soul.

Modern science does not have the tools to fully explain all natural phenomena. It can only explain those which can be mathematically represented and quantified. It places qualitative experiences in the mind and does not have the tools to explain the mind.

SLIDE 11

† Let us compare and contrast the Islamic ontological view versus the Neuroscientific ontological view, which is called Neuroscientific Reductionism

■ According to Neuroscientific Reductionism:

The world consists of only physical objects which have measurable properties.

Only things that are measurable exist: Mass, Volume, Length, Shape, Velocity, etc... These are all that are required to explain natural phenomena.

Everything else does not exist!

In this view, there is no room left for subjective experience, soul, self or consciousness.

The issue with this view is that it is an incomplete view of the world. There is a lot that must be ignored, or left unexplained:

Does not explain the varied human experiences (E.g., pleasure, satisfaction etc.)

Going back to the apple example, reductionists would say that your experience of enjoying that apple does not actually exist because it cannot be mathematically measured.

Removes meaning/purpose from the world (no higher purpose, no afterlife etc... - the metaphysical)

The question then arises, "Why are we alive or why do we exist in this world?"

■ According to the Islamic Worldview:

The world consists of physical and metaphysical things.

Physical objects have metaphysical properties:

Physical objects have a meaning and purpose.

A human is a composite of physical and metaphysical properties:

The soul, mind, and body.

- Going back to the question of “What is the world made of?” The neuroscientific reductionist view would answer this question as:

The world can be reduced to mere matter.

It can be explained by physics and expressed by mathematics (everything that exists can/should be mathematically measurable.)

This is the reason why there has been tremendous success of modern science; it is straightforward and gives you calculated results.

- BUT, when neuroscientific reductionism is faced with the idea of consciousness or the human mind...

The reality is that there are certain things that science can explain and many other things that science cannot explain. See [Science and Epistemology](#) Supplemental Material for more details (page 155).

Not everything can be reduced to the physical or the brain functions.

Some neuroscientists believe consciousness is an illusion. Science can observe and measure the function of our brains and what is physically present. Since we cannot measure the activities of the human mind, Neuroscience says that consciousness, therefore, does not exist. Yet, we know, consciousness is an integral aspect of humanity.

- † Ask students about their understanding (their feelings and thoughts) regarding this matter.

- This can be done formally, through an exit ticket type written assignment, where students write out where they stand in this discussion, or their confusions (if any remain).

- Use Descartes “I think therefore I am” or [Ibn Sina “Flying Man”](#) thought experiment to illustrate the undeniableity of the conscious self and subjective experience.

Islamic Studies Connection:

- † Extensive discussion on ensoulment can be enhanced here, where the full traveling of the soul is outlined, along with the various stages of the soul mentioned here.

Biology Connection:

- † Chapter on the Nervous System in Biology Textbook.
- † Study of neurons and nervous system, neurons communicating at the synapses, neurotransmitters.

SUPPLEMENTAL MATERIAL

Science and Epistemology

Science is a powerful method for understanding the natural world, but it does have its limitations when it comes to addressing certain aspects of epistemology, which is the study of knowledge and how we come to know things. Epistemology encompasses a wide range of topics, including normative, metaphysical, and ethical considerations, which require philosophical and ethical reasoning beyond the empirical methods of science. Therefore, a comprehensive understanding of knowledge and how we come to know things should integrate both scientific insights and philosophical reflections.

Here are some points to consider regarding what science can and cannot explain in relation to epistemology:

What Science Can Explain:

- † Empirical Knowledge - Science is particularly adept at explaining empirical knowledge, which is knowledge based on observation and measurement. It can provide insights into the physical world, natural phenomena, and the relationships between variables.
- † Methodology and Process - Science can clarify the methodologies and processes that contribute to acquiring knowledge. It offers a systematic and evidence-based approach to inquiry, which is valuable for understanding how we accumulate information and make discoveries.
- † Cognitive Processes - Science can investigate some aspects of cognitive processes, such as memory, perception, and decision-making. Through psychology and neuroscience, we can gain insights into how our brains process information.

What Science Cannot Explain:

- † Normative Questions - Science can tell us how people acquire knowledge, but it cannot dictate how they should acquire knowledge. Questions about what is justified belief or what constitutes reliable evidence fall into the realm of normative epistemology, which is outside the scope of science.
- † Metaphysical Questions - Science is limited to explaining natural phenomena and the physical world. It cannot address questions about the nature of reality, such as whether there are non-physical

realms or supernatural entities (God, angels etc..) that might influence knowledge.

- † Subjective Experience - While science can study the physical and observable aspects of consciousness and perception, it cannot fully explain subjective experiences, such as the “qualia” of what it is like to see the color red or taste a particular food. These aspects of consciousness remain philosophically challenging.
- † Axiomatic Systems - The foundations of knowledge, including the axioms upon which various knowledge systems are built (e.g., mathematics, logic), are not derived from scientific inquiry. They are taken as self-evident truths, and science relies on them but does not establish them.
- † Value and Ethics - Science can inform ethical discussions by providing information about the physical consequences of actions, but it cannot determine what is morally right or wrong. Questions of value and ethics are the domain of moral philosophy.

Unit 3: Lesson 1- Assessment

Section 1: Multiple Choice

1. What is the primary difference between the Islamic perspective and Neuroscientific reductionism concerning human nature?
 - a. The existence of consciousness
 - b. The purpose of life
 - c. The composition of the soul
 - d. The role of the brain
2. According to Islamic doctrine, what happens to the soul after death?
 - a. The soul ceases to exist
 - b. The soul goes through various stages and continues to exist
 - c. The soul becomes part of the physical body
 - d. The soul transforms into a different entity
3. From the Islamic perspective, what is personal identity related to?
 - a. Physical appearance
 - b. The brain's functions
 - c. The soul
 - d. Cultural background
4. According to scientific reductionism, what does the world consist of?
 - a. Only physical objects with measurable properties
 - b. Both physical and metaphysical things
 - c. Only metaphysical entities
 - d. Only sensory experiences
5. According to the holistic or Islamic worldview, what is a human composed of?
 - a. Only a physical body
 - b. The mind and consciousness
 - c. **Both physical and metaphysical properties •**
 - d. Only sensory qualities (qualia)

6. According to the holistic or Islamic worldview, what is a human composed of?

- a. Only a physical body
- b. The mind and consciousness
- c. Both physical and metaphysical properties
- d. Only sensory qualities (qualia)

Reflective Essay Topics - Ask students to write a reflective essay addressing the following points:

7. Summarize the Islamic concept of the soul and personal identity. Explain the concept of ensoulment according to the Islamic doctrine, detailing the stages of the soul's existence.

8. Discuss the evidence presented for the existence of the soul, both rational and revelatory.

9. Reflect on the implications of the purpose of human life from the three different perspectives discussed (Islamic view, neuroscientific reductionist view, and artificial intelligence).

Unit 3: Lesson 1- Assessment (Teacher's Edition)

Section 1: Multiple Choice

1. What is the primary difference between the Islamic perspective and Neuroscientific reductionism concerning human nature?
 - a. *The existence of consciousness •*
 - b. The purpose of life
 - c. The composition of the soul
 - d. The role of the brain
2. According to Islamic doctrine, what happens to the soul after death?
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 - a. Physical appearance
 - b. The brain's functions
 - c. *The soul •*
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4. According to scientific reductionism, what does the world consist of?
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5. According to the holistic or Islamic worldview, what is a human composed of?
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Reflective Essay Topics - Ask students to write a reflective essay addressing the following points:

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- e. Only a physical body
- f. The mind and consciousness
- g. *Both physical and metaphysical properties •*
- h. Only sensory qualities (qualia)

7. Summarize the Islamic concept of the soul and personal identity. Explain the concept of ensoulment according to the Islamic doctrine, detailing the stages of the soul's existence.

† *A: Personal identity is related to the soul, an identity that exists beyond this world and that carries through into the next life (not limited to the bodily identity). We still continue to exist as human beings in the afterlife. The difference would be that, in the afterlife, we are a soul without a body.*

■ Our soul goes through various stages (4 general stages)

- 8. Life of Souls - We were souls without bodies.
- 9. This Life - Our souls were breathed into our bodies.
- 10. In the Grave - Our souls will separate from our bodies and our bodies will decay, as our soul moves on. "Every soul shall experience death." (Surāh Ali-Imraan:185) - here it says that every soul shall "experience" death, and in many other translations, it says shall "taste" death, so this shows that death is not the end, but a step in a continued process.
- 11. The Afterlife - Our souls will be reunited with our resurrected bodies.

8. Discuss the evidence presented for the existence of the soul, both rational and revelatory.

† *A: Rational evidence: We know we have a soul through introspection. That means that we can look inside ourselves and see that the thing that experiences cognition, pain, pleasure, happiness, sadness, humility, arrogance, gratitude, and ingratitude, is something other than our bodies. We're not exactly sure what the soul is, but we know it is there.*

† Revelatory evidence:

- 1. Life of Souls - We were souls without bodies. • Revelatory Evidence: "Remember when your Lord took you out from the loins of the children of Adam their offspring and said, 'Am I not your Lord?' and they said, 'Yes indeed, we testify.' 'Now you have no right to say on Judgment Day, 'We were not aware of this.'" (Surāh Al-A'rāf 7:172)

2. This Life - Our souls were breathed into our bodies.
 - Revelatory Evidence: "... then an angel is sent to it and it breathes the soul into it and it is commanded to write down four things ..." (Bukhari)
 3. In the Grave - Our souls will separate from our bodies and our bodies will decay, as our soul moves on. • Revelatory Evidence: "Every soul shall experience death." (Surāh Al-Imrān 3:185) - here it says that every soul shall "experience" death, and in many other translations, it says shall "taste" death, so this shows that death is not the end, but a step in a continued process.
 4. The Afterlife - Our souls will be reunited with our resurrected bodies. • Revelatory Evidence: " ... then it will be blown in again and we will suddenly stand up, looking." (Az Zumar 39:68)
9. Reflect on the implications of the purpose of human life from the three different perspectives discussed (Islamic view, neuroscientific reductionist view, and artificial intelligence).
- a. Islam:
 - What does it mean to be human? - To have a soul
 - What is the purpose of life? - To develop the soul
 - b. Neuroscience:
 - What does it mean to be human? - To have a brain (to have just a physical body)
 - What is the purpose of life? - We would not be able to derive a purpose of life from just a mere body deduction.
 - c. Artificial Intelligence:
 - What does it mean to be human? - To act like a human
 - What is the purpose of life? - No real purpose if AI is only here to mimic human behavior.
10. Contrast the neuroscientific reductionist view with the Islamic worldview regarding the nature of existence and human experience. Provide examples and arguments supporting your evaluation.

Neuroscientific reductionist view - The world consists of only physical objects. The only things that exist are things that can be measured, everything else does not exist. This is an incomplete view of the world and does not account for everything we observe. The Islamic worldview consists of physical and metaphysical things in which these physical objects have metaphysical properties called qualia. These physical objects also have a meaning and purpose. Therefore, a human being is a composite of both physical and metaphysical properties: the Soul & the Body.

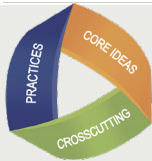
UNIT 3: WHAT DOES IT MEAN TO BE A HUMAN BEING?

Neuroscience, Artificial Intelligence and the Soul.

Lesson 1- Part 2: Physicalism, Modern Science, and Consciousness

Unit:3
Lesson: 1
Part: 2

Time
Length:
45–50 min



NGSS Instructional Outcomes

Next Generation Science Standards

- † HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms. (Relates to discussing consciousness and it is relationship to the soul within humans.)
- † HS-LS1-2: Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials. (Applicable to discussions about neural correlates of consciousness and brain function.)
- † HS-ESS2-7: Construct an argument supported by evidence for how forces responsible for plate motion cause changes to the Earth's surface. (While not directly related, constructing arguments supported by evidence applies to the discussions on consciousness and it is nature.)



CCSS Instructional Outcomes

Common Core State Standards

- † ELA-LITERACY.RST.11-12.1: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. (Aligns with discussions and analysis of various philosophical and scientific viewpoints on consciousness.)
- † ELA-LITERACY.RI.11-12.8: Delineate and evaluate the reasoning in seminal U.S. texts, including the application of constitutional principles and use of legal reasoning. (While not directly related to

U.S. texts, this standard emphasizes the evaluation of reasoning, which is relevant to discussions about consciousness and it is interpretation.)

Content Learning Outcomes:

- † Define consciousness and discuss how this experience cannot be reduced to physical processes.
- † Expand conceptual vocabulary for relevant discussions at the junction of theology and bioscience.
- † Discuss what neuroscience leaves out about consciousness.
- † Explain the basic concepts in neural correlates of consciousness
- † Demonstrate how the Islamic view of the world and the soul provides a comprehensive worldview that is lacking in scientism/physicalism.

Materials:

- † Presentation Slides: Slides 11–22
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Neuroimaging & Consciousness by Dr. Macksood Aftab
- † [Mary's Room: A philosophical thought experiment - Eleanor Nelsen](#)
- † Science and Epistemology - Supplemental Material

Instruction/Teacher Facilitation:

SLIDE 11

- † In the last lesson, we discussed the Islamic understanding of the human and compared that to the Neuroscientific Reductionist view of a human. We continued the discussion by asking what the world is made of. We ended the lesson with the topic of consciousness being a key aspect of humanity.
- † Let us pick up from there; in Islam, consciousness is an essential part of being human because it is a feature of the soul. The realm of science, on the other hand, views consciousness as an illusion since it cannot be directly observed or measured.

SLIDE 12

Is Science/Neuroscientific Reductionism right?

- † What is consciousness exactly and how do we know if it does indeed exist?

■ Let us consider **Ibn Sina (Avicenna)'s Floating Man Experiment:**

In this philosophical thought experiment, Ibn Sina asks us to imagine a person who has suddenly come into existence, suspended in an empty space, with no sensory experiences and no connection to the external world. This person has no sight, sound, touch, smell, or any other sensory input. This person is also devoid of any memories or knowledge of his/her past experiences. In other words, this person is isolated from the external world and has a completely blank mental slate.

He argues that even in this state of sensory deprivation and mental isolation, the person would still be aware of their own existence. The doubt it itself about whether one exists or not is a form of awareness. This awareness of one's existence, according to Ibn Sina, does not depend on sensory experiences or the external world. [So, regardless of the existence or non-existence of anything else, one knows at least they exist due to the fact that they have self-awareness.] He concludes that the thinking self, or the soul, is immaterial and possesses innate knowledge of it is own existence.

The Floating Man experiment emphasizes the existence of the thinking self as distinct from the body and the external world.

This conclusion can be reached through individual introspection; no need for any scientific knowledge or training nor any physical/measurable parameters.

■ This Floating Man Experiment and ibn Sina's ideas were a precursor to the ideas of later philosophers, such as René Descartes.

Rene Descartes, known as the founder of modern philosophy, came up with the famous statement "Cogito, ergo sum" (I think, therefore I am).

Basically, it states that regardless of the existence of anything else, at least one thing exists, and that thing is me. These experiments prove the existence of qualitative experience, a subjective self, something which is outside the parameters of modern science which only interrogates quantitative phenomena.

† How would we then define Consciousness? - (Ask students to answer)

SLIDE 13

† Experience of the world

- Sensations: Smell, Taste, Vision
- Perceptions: Thoughts
- Feelings: Love, Anger
- Awareness: Of oneself
- Intentionality: Understanding

† According to clinical medicine, consciousness is

Awakeness and Awareness: Alert & Oriented

Consciousness is assessed in the medical setting so that we can identify what it is to be human and what we look for when determining the presence of consciousness namely in end-of-life scenarios.

Glasgow Coma Scale - (a tool to test patient responsiveness) is used to objectively describe the extent of impaired consciousness.

If someone has been in an accident or lost consciousness at any point, when consciousness is regained, those attending to them will ask, "Do you know where you are?" and "Do you know what day/date is today?" to see if the person is aware of his surrounding, time and place. Note that both questions ask about non-physical elements.

In medicine, physicians assume existence of the subjective self to be real. This differs from the view of some neuroscientists and philosophers who would consider it a mere illusion or artifact.

SLIDE 14

† Who has consciousness? Who can we attribute consciousness to?

- "What Is It Like to Be a Bat?" is a paper by American philosopher Thomas Nagel in which he argues that there are facts about a conscious experience that are subjective and can only be known from that subjective perspective. Even if we know all the objective facts about bats, we cannot actually know what it is really like to be a bat.
- Reductionists have trouble addressing this subjective experience argument.

SLIDE 15

† Neuroscientific Reductionist View:

- Consciousness can be reduced to a brain state: "I am just my brain"
- Friedrich Nietzsche's 'Thus Spoke Zarathustra': "The awakened and knowing say: body am I entirely, and nothing more; and soul is only the name for something about the body."
- This "neurocentric" view has been widely accepted. As Moheb Costandi wrote in his book 'Body Am I', "The idea that we are our brains is now firmly established."
- Daniel Dennett, American philosopher and cognitive scientist, also upholds the notion that consciousness is an illusion.
- 'The Astonishing Hypothesis' is a book written by English scientist Francis Crick in 1994. Crick is one of the co-discoverers of the molecular structure of DNA. He later became a theorist for neurobiology and studied the brain.] In this book, he wrote: "You, your joys and your sorrows, your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behavior of a vast assembly of nerve cells and their associated molecules."
- 'Neurobiography of the Brain, from the Womb to Alzheimer's' by D. F. Swaab portrays this concept that we do not just have brains: we are our brains.
- Neuroscientists believe that consciousness is just a brain function which occurs due to neurological interactions/ neurons firing within your brain. So where in the brain exactly is consciousness occurring?

SLIDE 16

† Neural Correlates of Consciousness (NCC) - Where does Consciousness Reside? Can Neuroscience explain consciousness?

- Conscious awareness is closely associated with the cerebral cortex, an intricately folded and connected sheet of nervous tissue. Each experience corresponds to a specific set of neural activities, called the neuronal correlates of consciousness (NCC). These neural activities form the default mode network and occur in the posterior hot zone of the brain that consists of the parietal, occipital and temporal lobes.

- The brain structures play a significant role in self-awareness. The complexity of the neural excitations represents the degree to which a person is conscious.
- Note: Does this explain subjective experience (Consciousness)? No. It simply provides a physical correlate for the subjective experience.

SLIDE 17

† Disorders of Consciousness

- Locked-In-Syndrome - is a rare disorder of the nervous system where people are paralyzed except for the muscles that control eye movement. They are conscious (aware) and can think and reason, but cannot move or speak; they may be able to communicate with blinking eye movements.
- Vegetative States - occurs when the cerebrum (the part of the brain that controls thought and behavior) no longer functions.
- Minimally Conscious States - A person who shows clear but minimal or inconsistent awareness

† Assessment (to confirm consciousness):

- Intentional ability to carry out willed action or self-generated action

† Levels of consciousness assessed by fMRI experiments

- Passive (stimulus elicit is activation)
- Active (response to stimuli detected)
- Communicating (can choose between options)
- Summary: Advanced brain scans can be used to assess if a patient has awareness and agency even if they cannot physically communicate. This suggests that conscious experiences are localized in brain regions and networks. However, consciousness remains qualitatively distinct from any physical process.

SLIDE 18

† Semantic reconstruction of continuous language from non-invasive brain recordings

- In new research involving a passage read to a patient and looking at their brain activity in brain scans, the passage is reconstructed without the patient having to say/verbalize anything.

- A similar study was done using visual stimuli and that image was being reconstructed based on the activity in the brain of the patient.
- The issue here is that the privacy of conscious experience is deteriorating.
- **Question for students:** Does “mind-reading” technology take anything away from the reality of consciousness (or subjective experience)? Answer is No, human subjectivity remains a distinct undeniable reality.

SLIDE 19

† Human Brain Organoids and Consciousness

- Brain tissue is being developed in the lab to create a human brain organoid that can simulate the brain activity of a human.
- An ethical question is if this brain organoid can feel pain because it does have the same brain circuitry that would feel pain in a normal human brain. And if so, have we replicated some degree of consciousness? Is consciousness the brain it itself, or is it very closely related to the brain and brain function, or is it completely extrinsic to the brain?

Scan the QR code to watch Dr. Macksood Aftab explains the above aspects and gives an overview of [Neuroimaging & Consciousness](#).



Here we must also explore: Is basic consciousness (such as the feeling of pain) all there is to have human experience? The full picture encompasses much more including: intentionality, higher order thinking, and deliberation.

SLIDE 20

† What is the problem with the neuroscientific reductionist view of consciousness being just neurological activity? (Ask students to answer this question.)

- If everything is reduced to just a physical state or firing neurons, there is no room for the soul in this theory/philosophy. No soul means no purpose in life; the purpose of human existence is being ignored.
- Consciousness would then be just alertness and brain activity, not a moral consciousness.
- Why is there an experience associated with a physical state? Physical states often produce the experience of emotions.

For example, a person whose heartbeat speeds up because of excitement or nervousness. Also, the experience of emotions can affect physical states.

- The Hard Problem of Consciousness is the problem of accounting in physical terms for subjective, intrinsic, first-person experiences. Physicalism can explain the mechanism of how the brain works but it does not explain *why* it works the *way* it does. [Connect back to the discussion of consciousness and the questions of “who has consciousness” “What it is like being that person/animal.” The physicalism of neuroscientific reductionism does not account for a unique, personal, subjective existence.]
- Are we Philosophical Zombies? Proponents of the philosophical zombie argument, such as David Chalmers, argued that since a philosophical zombie is by definition physically identical to a *conscious* person, are we philosophical zombies? Chalmers argued that if a philosophical zombie, a being that is physically identical to a conscious person but lacks subjective experience, were possible, it would disprove physicalism. This is because physicalism claims that everything about consciousness can be explained by physical processes. However, the argument is self-refuting. If a philosophical zombie is truly identical in every physical way to a conscious person, there is no reason to assume it lacks consciousness. Simply put, being physically identical should also mean being consciously identical. Basically, it is a self-refuting argument because it is clear, that just being physically identical does not make them consciously identical.
- The brain is absolutely necessary but it is NOT a sufficient condition.

SLIDE 21

† Group Thought Exploring Activity - Mary's Room

- Ask the question: Can being a human be reduced to Neuroscience?
- Scan QR code to watch: [Mary's Room: \(A\) philosophical thought experiment](#)
- Prepare students by asking them to think of how to answer these questions:

From a neuroscientific reductionist view, did Mary learn anything new from experiencing the red apple?



From an Islamic perspective of consciousness, did Mary learn anything new?

- Outline with students points brought up in the video:

The Knowledge Argument - states that there are non-physical properties and knowledge that can only be discovered through conscious experience.

Contrasting Physicalism - states that everything, including mental states, has a physical explanation.

- Students might discuss how seeing color is totally different from just learning about it. Some quality of this experience transcends the physical description.

- After the discussion, clearly state that experiential knowledge is not the same as physical knowledge.

These experiences have properties called qualia - subjective qualities that you cannot accurately describe or measure.

Qualia is unique to the person experiencing it. Physical facts cannot fully explain mental states, especially feelings.

- [Note: at 3:00 of the video, the topic goes into AI, so this serves as a good prelude to the next lesson.]

There are limit is to knowledge; knowing facts about something is different from experiencing something.

SLIDE 22

- † Summary: The Soul, Consciousness, and Neuroscience

- a. Mental states cannot be described by physical facts

Contradicts physicalism

- b. How does a neuroscientist analyze consciousness

He needs to deny our experience and knowledge

- c. How does a Muslim analyze consciousness

Consciousness is the experience of the unobservable soul that we know through introspection and revelation.

- † The unobservable soul is known to us through introspection and revelation. Neuroscience studies the correlations between physically observable phenomena. Neuroscientific reductionism fails to explain fully what it means to be a human as it denies the soul. The Islamic perspective accounts for our physical and metaphysical properties and interactions.

- † *Extra Activity: How would each side defend their position? Model a debate.*

Biology Connections:

- † Chapter on the Nervous System in Biology Textbook.
- † Study of neurons and nervous system, neurons communicating at the synapses, neurotransmitters
- † Study of the human brain, cerebral cortex, fMRI scans, and limbic system.

Unit 3: Lesson 1- Assessment

Section: Multiple Choice

1. According to Ibn Sina's Floating Man Experiment, what does self-awareness primarily depend on?
 - a. Sensory experiences
 - b. Memories and past experiences
 - c. External stimuli
 - d. Inner cognition
2. What is the Glasgow Coma Scale primarily used for?
 - a. Assessing motor skills
 - b. Evaluating neurological disorders
 - c. Describing consciousness levels
 - d. Measuring brainwave activity
3. Which philosopher is associated with the statement "Cogito, ergo sum" (I think, therefore I am)?
 - a. Francis Crick
 - b. Friedrich Nietzsche
 - c. René Descartes
 - d. David Chalmers
4. What is the primary criticism against the neuroscientific reductionist view of consciousness?
 - a. It overemphasizes the role of the soul
 - b. It disregards physicalism
 - c. It does not allow room for subjective experiences
 - d. It cannot explain neurological disorders
5. Which brain regions are closely associated with the neural correlates of consciousness (NCC)?
 - a. Frontal lobes
 - b. Cerebellum
 - c. Parietal, occipital, and temporal lobes (Default Mode Network)
 - d. Brainstem

6. What is the Hard Problem of Consciousness concerned with?
 - a. Explaining neurological disorders
 - b. Defining qualia
 - c. Accounting for subjective experiences •
 - d. Demonstrating physicalism
7. According to the Knowledge Argument, what does conscious experience provide that cannot be attained through physical facts?
 - a. Qualia
 - b. Objective knowledge
 - c. Neurological patterns
 - d. Subjective reasoning
8. What is the primary purpose of the Mary's Room thought experiment?
 - a. To refute Ibn Sina's theories
 - b. To support physicalism
 - c. To illustrate how subjective experience adds to knowledge/information
 - d. To demonstrate the existence of qualia
9. What is a philosophical zombie?
 - a. A conscious being with no physical properties
 - b. A physically identical being without conscious experience
 - c. A being with both physical and conscious properties
 - d. A theoretical concept irrelevant to consciousness studies
10. What is the central issue with the reductionist view of consciousness?
 - a. It overemphasizes subjective experiences
 - b. It lacks empirical evidence.
 - c. It disregards physical explanations.
 - d. It does not consider consciousness to be real.

Section 2: Short Answer/Essay Questions

1. Explain Ibn Sina's Floating Man Experiment and its implications regarding self-awareness.

2. Discuss the contrasting views of consciousness between the neuroscientific reductionist perspective and the Islamic perspective.

3. Evaluate the limitations of the neuroscientific reductionist view in explaining consciousness, considering subjective experiences and the Hard Problem of Consciousness.

4. Describe the neural correlates of consciousness and their association with brain regions, highlighting their significance in understanding consciousness.

5. Explain the concept of qualia and its relevance to the debate about consciousness, incorporating its unique subjective nature and why it poses a challenge to reductionist views.

Unit 3: Lesson 1 - Assessment (Teacher's Edition)

Section: Multiple Choice

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 - a. It overemphasizes subjective experiences
 - b. It lacks empirical evidence.
 - c. It disregards physical explanations.
 - d. *It does not consider consciousness to be real.* •

Section 2: Short Answer/Essay Questions

1. Explain Ibn Sina's Floating Man Experiment and its implications regarding self-awareness. *(Answer should cover the idea of self-awareness without sensory experiences or external stimuli, emphasizing inner cognition as the source of self-awareness.)*
- † *Sample Answer: Ibn Sina's Floating Man Experiment entails imagining a person devoid of sensory experiences, memories, and connections to the external world. Despite this sensory deprivation, Ibn Sina argues that the individual would still possess self-awareness. The essence of self-awareness, in this case, does not rely on external stimuli or past experiences but stems from inner cognition. This experiment implies that self-*

awareness or consciousness does not solely depend on sensory inputs but is an innate feature of the thinking self, existing independently of external stimuli or memories.

2. Discuss the contrasting views of consciousness between the neuroscientific reductionist perspective and the Islamic perspective. *(Answer should cover the fundamental differences in their interpretations, addressing consciousness as an illusion in the neuroscientific perspective and as an essential aspect of the soul in the Islamic perspective.)*

■ *Sample Answer: The neuroscientific reductionist perspective regards consciousness as an illusion, attributing it solely to brain functions and neuronal activities, dismissing any metaphysical or spiritual significance. In contrast, the Islamic perspective views consciousness as an integral part of the soul, connecting it to a deeper spiritual realm. While Neuroscientific reduces consciousness to physical processes, Islam attributes consciousness to the soul's existence beyond the physical body, emphasizing its continuity beyond bodily functions and material existence.*

3. Evaluate the limitations of the neuroscientific reductionist view in explaining consciousness, considering subjective experiences and the Hard Problem of Consciousness. *(Answer should explore the challenges faced by this perspective in accounting for subjective experiences and the inherent difficulty in explaining why consciousness arises.)*

■ *Sample Answer: The neuroscientific reductionist view encounters limitations in explaining consciousness due to its inability to account for subjective experiences and the "Hard Problem of Consciousness." Subjective experiences, such as qualia, present a challenge as they are inherently personal and cannot be fully described or explained by physical facts alone. The "Hard Problem" pertains to understanding why and how consciousness arises from physical processes, posing a challenge for reductionist theories that attempt to solely explain consciousness in terms of neuronal activities without addressing its fundamental nature. This view also ignores the purpose of a soul/consciousness.*

4. Describe the neural correlates of consciousness and their association with brain regions, highlighting their significance in understanding consciousness. *(Answer should cover the*

brain regions associated with consciousness and their role in determining different levels of conscious awareness.)

- *Sample Answer: Neural correlates of consciousness (NCC) are specific neural activities associated with conscious awareness, primarily located in the parietal, occipital, and temporal lobes of the cerebral cortex. These regions exhibit complex neural excitations corresponding to different conscious experiences. Understanding NCC is crucial in determining levels of conscious awareness and assessing impairments in disorders such as locked-in syndrome, vegetative states, and minimally conscious states.*
5. Explain the concept of qualia and its relevance to the debate about consciousness, incorporating its unique subjective nature and why it poses a challenge to reductionist views. *(Answer should define qualia and discuss how it presents difficulties for theories that attempt to reduce consciousness to purely physical explanations.)*
- *Qualia refers to the subjective, individual experiences or qualities of conscious perception that cannot be fully described or measured objectively. They include the subjective aspects of sensations, emotions, and perceptions that are unique to each person. Qualia presents a challenge to reductionist views of consciousness as they cannot be fully explained by physical facts alone. Their subjective nature and the difficulty in quantifying or describing them solely through physical terms suggest that consciousness transcends mere physical explanations.*

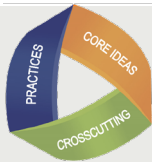
UNIT 3: WHAT DOES IT MEAN TO BE A HUMAN BEING?

Neuroscientific, Artificial Intelligence and the Soul.

Lesson 2: Artificial Intelligence

Unit: 3
Lesson: 2

Time
Length:
45–50 min



NGSS Instructional Outcomes

Next Generation Science Standards

- † LS1: From Molecules to Organisms: Structures and Processes: Relates to understanding human consciousness and AI.
- † ETS1: Engineering Design: Connects with exploring and understanding AI technology.
- † Cause and Effect: Discusses the implications of AI on humanity and consciousness.
- † Systems and System Models: Considers AI as a system in comparison to the human system.

Science and Engineering Practices:

- † Developing and Using Models: Involves discussions on AI models and human consciousness.
- † Obtaining, Evaluating, and Communicating Information: Engages students in analyzing and discussing various AI-related information.



CCSS Instructional Outcomes

Common Core State Standards

Reading Standards for Informational Text:

- † Key Ideas and Details: Encourages students to comprehend and engage with informational texts and videos on AI and human consciousness.
- † Craft and Structure: Analyzing videos, presentations, and discussions aligns with understanding the structure of multimedia presentations.

Writing Standards:

- † Text Types and Purposes: Potential writing activities could align with producing information/explanatory texts or argumentative essays based on the discussed topics.
- † Production and Distribution of Writing: Encourages written expression about AI, consciousness, and theological implications.

Speaking and Listening Standards:

- † Comprehension and Collaboration: Engages students in discussions, debates, and reflective activities.
- † Presentation of Knowledge and Ideas: Encourages presentations or discussions showcasing understanding and reflections about AI and consciousness.

Content Learning Outcomes:

- † Identify how Artificial Intelligence differs from Human Consciousness.
- † Define consciousness and discuss how this experience cannot be reduced to physical processes.
- † Expand conceptual vocabulary for relevant discussions at the junction of theology and bioscience.
- † Demonstrate how the Islamic view of the world and the soul provides a comprehensive worldview that is lacking in scientism/physicalism.

Materials:

- † [Presentation Slides: Slides 23–37](#)
- † [Triple-Entry Vocabulary Journal](#) (Student Responsibility)
- † Meet Sophia Video - [Meet Sophia: The first robot declared a citizen by Saudi Arabia](#)
- † Turing Test Video - [The Turing test: Can a computer pass for a human? - Alex Gendler](#)
- † How ChatGPT works - [So How Does ChatGPT really work? Behind the screen!](#)
- † Website - [OpenAI](#)
- † Artificial Intelligence and Personhood Video - [Artificial Intelligence & Personhood: Crash Course Philosophy #23](#)

Instruction/Teacher Facilitation:

- † “What does it mean to be human” is a very important question and discussion, especially in today’s society with so many conflicting worldviews. This leads us to robots and artificial intelligence; can robots really replace us as humans? Well, that depends on how “human” they are and how we define humans.
- † Applying what we have learned in Lesson 1 about what it means to be human and what it means to have consciousness, let us now discuss artificial intelligence and see if it resolves these issues and whether AI can be defined as something human-like.

SLIDE 23

- † To connect to our previous lessons, we will recap and reflect on:
 - Neuroscience - we have explored the debates on human consciousness, and the unanswered question of it is mechanism.
 - Artificial Intelligence - we will delve into this topic now. For AI, we know it is mechanism (how it works) but the question is: Does AI have consciousness?

SLIDE 24

- † Let us begin with: What is Artificial Intelligence or AI?
 - Artificial intelligence in very simple terms is the “ability to perform a task.”
 - It is the science of making machines think like humans. AI technology can process large amounts of data in ways humans cannot, hence the “intelligence.” The goal for AI is to be able to do things such as recognize patterns, make decisions, and judge, similar to the way humans do.
 - 2 types of Artificial Intelligence: Weak AI and Strong AI
 - Weak AI
 - Machine Learning - broadly defined as the capability of a machine to imitate intelligent human behavior. Machine learning focuses on the use of data and algorithms to imitate the way humans learn, gradually improving it is accuracy.
 - Deep Learning - a type of machine learning that teaches computers to process data in a way that is inspired by the human brain. Deep learning models can recognize complex patterns in pictures, texts, sounds, and other data to produce accurate insights and predictions. Essentially, it is a neural network with three or more

layers. These neural networks attempt to simulate the behavior of the human brain—albeit far from matching its ability—allowing it to “learn” from large amounts of data.

Neural Networks - Artificial neural networks are a branch of machine learning that uses interconnected nodes or neurons in a layered structure that resembles the human brain.

Strong AI & Artificial Generalized Intelligence - Strong AI aims to create intelligent machines that are indistinguishable from the human mind. The AI machine would have to learn through input and experiences, constantly progressing and advancing its abilities over time. Like a robot that thinks and functions like a human.

Generative AI & Large Language Models (LLMs) - Generative AI models can take inputs such as text, image, audio, video, and code and generate new content into any of the modalities mentioned. For example, it can turn your texts into an image, turn an image into a song, or turn video into text. **Large Language Model** is a type of GenAI that is focused on generating text, for example, the most well-known LLM is ChatGPT, trained on vast amounts of text data.

Augmented Intelligence in Health Care - Augmented intelligence is a design pattern for a human-centered partnership model of people and artificial intelligence (AI) working together to enhance cognitive performance, including learning and decision-making.

NOTE: Augmented intelligence offers suggestions to humans to make decisions, unlike artificial intelligence, which works through data and makes autonomous decisions.

SLIDE 25

- What implications does Generative AI have for humanity?

Watch Video “Meet Sophia”: [Meet Sophia: The first robot declared a citizen by Saudi Arabia.](#)

Post-video discussion - Differentiate between intelligence (ability to do things) and consciousness (ability to experience things).

Ask students: Can you attribute consciousness to something that is created with a different (non-biological) material?

SLIDE 26

- The Turing Test - Can a computer talk like a human? The Turing test is a test to determine if a computer program can think of responses that can fool a human into believing it, too, is human.

Watch The Turing test: Can a computer pass for a human?
- Alex Gendler

Ask students:

Do you think Sophia passes the Turing Test?

Do you think we will ever be able to pass the test? Could we get to a point of making a “human”?

SLIDE 27

Google Engineer AI Discussion -

Ask students if this transcript was convincing? Would this pass the Turing Test?

SLIDE 28

Everyone has heard of and used chatGPT by now, but do you know how it works:

Ask students: What type of AI is chatGPT? [A: Large Language Models (LLMs) and has now many generative AI features.]

Watch: [So How Does ChatGPT really work? Behind the screen!](#)

[The entire video does not have to be viewed, just enough for the students to get an idea of how it works.]

Let us try it, talk to a computer - [OpenAI](#) - ChatGPT - have students open the website and ask a series of questions.

[Many students have used ChatGPT and other forms of GPTs so they might already be aware of the experience. Therefore, this activity can be used at teacher’s discretion]

SLIDE 29

† Is Artificial Intelligence Really Human-Like?

- Watch [Artificial Intelligence & Personhood: Crash Course Philosophy #23](#)

SLIDE 30

- Chinese Room Experiment - Ask students their thoughts on the Chinese Room Experiment and if they really think that the person could pass as strong AI.

Compare and contrast the Turing Test to Searle's Chinese Room "test"

Searle believes that the computer/AI must have actual understanding in order to pass as strong AI or "human," which he believes is impossible. Do you agree with him?

Hank thinks his brother John might be an android, but probably not. Why do you think he thinks his brother is probably not an android or some AI machine?

- Highlight the irony of AI having the physical structure/setup but no ability to explain consciousness, while human beings have consciousness but no ability to explain it structurally.
- Display this through the idea of intentionality as seen through the Chinese Room Experiment (can answer a question through syntax [structure of language] but not with semantics [meaning of the words]).

Knowledge vs. Understanding

- Correlation vs Causation

In the Chinese case, I have everything that artificial intelligence can put into me by way of a program, and I understand nothing; in the English case I understand everything, and there is so far no reason at all to suppose that my understanding has anything to do with computer programs.

- Relationship with the world: is this how the world actually functions? Just piece together information without any true meaning?
- Syntax vs Semantics: Syntax is the structure of language whereas Semantics is the meaning of individual words. (Think of how people use the Thesaurus to just replace words and sometimes it does not sound right or make sense in that context.)

SLIDE 31

† What aspects of humanity does AI replicate?

- Compare the structure of Machines and AI – electronic circuit is, silicone chips to that of human beings' biological structure, hormones, cells.

- Behavior and Functionally replicable....but
- Experiences
 - Comprehensive Knowledge
 - Understanding
 - Spiritual states
 - Intentionality/Purpose
 - Intelligence and Consciousness are not identical

SLIDE 32

† Karamali Worship Experiment - Spiritual Experience (Human experience vs AI)

- There is a vast richness in human experience, such that if a module wants to explain or understand it, it would be incapable of doing so.
- Is it feasible to expect AI to do something such as repentance of a sin? No, because there is no feeling of regret (or any feelings at all actually), of doing something wrong, so why would it repent.
- Complexity of what it means to be human - having a holistic worldview makes having a soul not problematic, but is definitive of being human.
- "He has truly succeeded who purifies his soul and mentions the Name of his Lord, and prays. Nay, but you prefer the present life; even though the world to come is better, and more enduring." (Surāh Al-A'la 87:14-16) - The Islamic concept of being a human and human existence/purpose is to purify the soul and build on the inner-experience.

SLIDE 33

- There is a willful modulation of human states; you cannot merely look at the physical body and identify why it is happy or sad. Our purpose in life is to regulate these inner-states: Going from ____ to _____.
 - Arrogance to Humility
 - Self-Admiration to Gratitude
 - Love of This World to Love of God
 - Love of Prestige to Sincerity
 - Rebellion to Repentance

SLIDE 34

- Let us assume a computer passes the Turing Test

Can it really talk?

Can it come close to God?

SLIDE 35

† An Islamic Model of the Soul

- This diagram represents an Islamic model of the soul, which is a concept in Islamic psychology. In this model, the '*nafs*' or self goes through a process of development and refinement. There are three principal stages of *nafs*:

The inciting *nafs* (*an-nafs al-ammārah*) is the lower self that incites people to commit evil and pursue base instincts.

The self-accusing *nafs* (*an-nafs al-lawwāmah*) is the stage where the self becomes conscious of its wrongdoings and starts to seek forgiveness and betterment.

The *nafs* at peace (*an-nafs al-mutma'innah*) is the final stage where the self is at peace with itself and with its Creator, having achieved a state of tranquility and contentment.

- This progression is seen as a journey of spiritual development that moves from a focus on the ego and materialism towards a state of self-awareness and peace.

- Key terms presented here:

Fitra: The natural disposition or innate tendency humans are born with to worship God.

Rūh: The spirit or soul, which is breathed into a human being.

Qalb: The spiritual heart, not the physical one, considered the seat of the spiritual and emotional life.

Nafs: The self or ego, which has different stages of development.

'*Aql*: Intellect or reason, which is used to discern truth.

Hawā: Desires or whims, which can lead one astray if not controlled.

Munjiyāt: Acts that bring salvation.

Muhlikāt: Destructive, sinful acts.

Jihad an Nafs: The spiritual struggle within oneself against sin.

Tazkiyat an Nafs: Purification of the self.

Tahdhib al Akhlaq: Refinement of character.

- † These terms map out a person's journey of spiritual purification and growth, aiming for a state of harmony with the divine will.

- † Ask students: Would AI be able to go through these stages? If not, then how close or distant is it to being human?
- † A computer does not have many of these elements of the soul, therefore it can never be human. This answers the question very clearly that a computer does not have the ability to get close to Allah SWT.
- † Furthermore, it does not talk with an '*aq*' of its own, it is only mimicking the behavior of talking. There is no emotion that is truly felt and no changing of the states of the heart and soul.

SLIDE 36

- As Allah SWT says: "He has truly succeeded who purifies his soul and mentions the Name of his Lord, and prays. Nay, but you prefer the present life; even though the world to come is better, and more enduring." (Surāh Al-A'la, 87:14-17)
- Therefore, a computer or any form of AI can never truly be successful.

SLIDE 37

- † In summary:
 - Going back to comparing, "what does it mean to be human?" And "what is the purpose of life?" we can see that only Islam provides us with a life purpose that is connected to the soul.
 - Neuroscience is limited to providing information about our physical body and physical existence.
 - And AI is only mimicking human behavior... and we see that:
 - Al is a functional algorithmic activity, whereas human activity is vast and has different intentionalities.
 - A human has a spiritual experience (for example, crying in tarāwīḥ); can the spiritual experience be functionally replicated? (A: No)
 - AI creates functional correlations between physically observable phenomena but never crosses into the unobservable soul, which we know through introspection and revelation.

Conclusion and Unite Summary:

- † Review the Islamic concept, the soul.
- † Review the Islamic concept, the human nature.
- † Compare where science is successful and where it is facing challenges in understanding and explaining consciousness.

- † Explain the limitations that come with AI and it is bridging towards humanity/human consciousness.
- † Show the real experience of humanity outstrips that of AI.
- † Review the Islamic worldview of metaphysics.
- † Conclude that having a holistic worldview makes having a soul not problematic.

Biology Connections:

- † Artificial intelligence (AI) and machine learning tools are revolutionizing life science research and biomedical applications.

Islamic Studies Connections:

- † As part of the post-video discussion on artificial intelligence and personhood, ensoulment can also be examined due to its mention in the video. Although it was presented as only a possibility, we know as Muslims, that ensoulment is a necessary factor in being human.
 - On the authority of Abdullah bin Masud (R): Verily the creation of each one of you is brought together in his mother's belly for forty days in the form of (*nutfa*) [Gamete up to embryo]. Then he is a (*'alaqa*) for a like period [embryo to fetus]. Then a (*mudgha*) for a like period [fetus to human]. Then there is sent to him the angel who blows the breath of life into him [En soulment = Personhood] (Related by Bukhari and Muslim)
- † According to the majority of scholars, the soul is blown into the fetus at 120 days (4 months) after conception. This is based on a Qur'anic verse and a Prophetic tradition:
- † "And verily we did create man from a quintessence (of clay). Then we placed him (as a drop of sperm) in a place of rest, firmly fixed. Then we made the sperm into a clot of congealed blood. Then of that clot, we made a (fetus) lump. Then we made out of that lump bones and clothed the bones with flesh. Then we developed out of it another creature (by breathing life into it). So blessed be Allah, the Best of Creator." (Surāh al-Mu'minun: 12-14)
- † "...then He fashioned them and had a spirit of His Own breathed into them. And He gave you hearing, sight, and intellect. Yet you hardly give any thanks." (Surāh As-Sajdah: 9)
 - The exact moment of *Nafkh ar-rūh* (Blowing of the Soul/ En soulment) cannot be determined, but from revelation, we know that it is somewhere between 40-120 days.
 - NOTE: a beating heart is not proof of ensoulment; this is a physical function.

Unit 3: Lesson 2- Assessment

Section: Multiple Choice

1. According to Ibn Sina's Floating Man Experiment, what does self-awareness primarily depend on?
 - a. Sensory experiences
 - b. Memories and past experiences
 - c. External stimuli
 - d. Inner cognition
2. What is the Glasgow Coma Scale primarily used for?
 - a. Assessing motor skills
 - b. Evaluating neurological disorders
 - c. Describing consciousness levels
 - d. Measuring brainwave activity
3. Which philosopher is associated with the statement "Cogito, ergo sum" (I think, therefore I am)?
 - a. Francis Crick
 - b. Friedrich Nietzsche
 - c. René Descartes
 - d. David Chalmers
4. What is the primary criticism against the neuroscientific reductionist view of consciousness?
 - a. It overemphasizes the role of the soul
 - b. It disregards physicalism
 - c. It doesn't allow room for subjective experiences
 - d. It cannot explain neurological disorders
5. Which brain regions are closely associated with the neural correlates of consciousness (NCC)?
 - a. Frontal lobes
 - b. Cerebellum
 - c. Parietal, occipital, and temporal lobes (Default Mode Network)
 - d. Brainstem

6. What is the Hard Problem of Consciousness concerned with?
 - a. Explaining neurological disorders
 - b. Defining qualia
 - c. Accounting for subjective experiences
 - d. Demonstrating physicalism
7. According to the Knowledge Argument, what does conscious experience provide that cannot be attained through physical facts?
 - e. Qualia
 - f. Objective knowledge
 - g. Neurological patterns
 - h. Subjective reasoning
8. What is the primary purpose of the Mary's Room thought experiment?
 - i. To refute Ibn Sina's theories
 - j. To support physicalism
 - k. To illustrate how subjective experience adds to knowledge/information
 - l. To demonstrate the existence of qualia
9. What is a philosophical zombie?
 - m. A conscious being with no physical properties
 - n. A physically identical being without conscious experience
 - o. A being with both physical and conscious properties
 - p. A theoretical concept irrelevant to consciousness studies
10. What is the central issue with the reductionist view of consciousness?
 - q. It overemphasizes subjective experiences.
 - r. It lacks empirical evidence.
 - s. It disregards physical explanations.
 - t. It does not consider consciousness to be real.

Section 2: Short Answer/Essay Questions

1. Explain Ibn Sina's Floating Man Experiment and its implications regarding self-awareness.
2. Discuss the contrasting views of consciousness between the neuroscientific reductionist perspective and the Islamic perspective.

3. Evaluate the limitations of the neuroscientific reductionist view in explaining consciousness, considering subjective experiences and the Hard Problem of Consciousness.
4. Describe the neural correlates of consciousness and their association with brain regions, highlighting their significance in understanding consciousness.
5. Explain the concept of qualia and its relevance to the debate about consciousness, incorporating its unique subjective nature and why it poses a challenge to reductionist views. (

Unit 3: Lesson 2- Assessment (Teacher's Edition)

Section: Multiple Choice

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Section 2: Short Answer/Essay Questions

1. Explain Ibn Sina's Floating Man Experiment and its implications regarding self-awareness. (Answer should cover the idea of self-awareness without sensory experiences or external stimuli, emphasizing inner cognition as the source of self-awareness.)

Sample Answer: Ibn Sina's Floating Man Experiment entails imagining a person devoid of sensory experiences, memories, and connections to

the external world. Despite this sensory deprivation, Ibn Sina argues that the individual would still possess self-awareness. The essence of self-awareness, in this case, doesn't rely on external stimuli or past experiences but stems from inner cognition. This experiment implies that self-awareness or consciousness doesn't solely depend on sensory inputs but is an innate feature of the thinking self, existing independently of external stimuli or memories.

2. Discuss the contrasting views of consciousness between the neuroscientific reductionist perspective and the Islamic perspective. (Answer should cover the fundamental differences in their interpretations, addressing consciousness as an illusion in the neuroscientific perspective and as an essential aspect of the soul in the Islamic perspective.)

■ Sample Answer: The neuroscientific reductionist perspective regards consciousness as an illusion, attributing it solely to brain functions and neuronal activities, dismissing any metaphysical or spiritual significance. In contrast, the Islamic perspective views consciousness as an integral part of the soul, connecting it to a deeper spiritual realm. While neuroscience reduces consciousness to physical processes, Islam attributes consciousness to the soul's existence beyond the physical body, emphasizing its continuity beyond bodily functions and material existence.

3. Evaluate the limitations of the neuroscientific reductionist view in explaining consciousness, considering subjective experiences and the Hard Problem of Consciousness. (Answer should explore the challenges faced by this perspective in accounting for subjective experiences and the inherent difficulty in explaining why consciousness arises.)

■ Sample Answer: The neuroscientific reductionist view encounters limitations in explaining consciousness due to its inability to account for subjective experiences and the "Hard Problem of Consciousness." Subjective experiences, such as qualia, present a challenge as they are inherently personal and cannot be fully described or explained by physical facts alone. The "Hard Problem" pertains to understanding why and how consciousness arises from physical processes, posing a challenge for reductionist theories that attempt to solely explain consciousness in terms of neuronal activities without addressing its fundamental nature. This view also ignores the purpose of a soul/consciousness.

4. Describe the neural correlates of consciousness and their association with brain regions, highlighting their significance in understanding consciousness. (Answer should cover the brain regions associated with consciousness and their role in determining different levels of conscious awareness.)

- Sample Answer: Neural correlates of consciousness (NCC) are specific neural activities associated with conscious awareness, primarily located in the parietal, occipital, and temporal lobes of the cerebral cortex. These regions exhibit complex neural excitations corresponding to different conscious experiences. Understanding NCC is crucial in determining levels of conscious awareness and assessing impairments in disorders such as locked-in syndrome, vegetative states, and minimally conscious states.

5. Explain the concept of qualia and its relevance to the debate about consciousness, incorporating its unique subjective nature and why it poses a challenge to reductionist views. (Answer should define qualia and discuss how it presents difficulties for theories that attempt to reduce consciousness to purely physical explanations.)

- Qualia refers to the subjective, individual experiences or qualities of conscious perception that cannot be fully described or measured objectively. They include the subjective aspects of sensations, emotions, and perceptions that are unique to each person. Qualia present a challenge to reductionist views of consciousness as they cannot be fully explained by physical facts alone. Their subjective nature and the difficulty in quantifying or describing them solely through physical terms suggest that consciousness transcends mere physical explanations.

UNIT 4:

Human Enhancement & Transhumanism

**Are We Changing the Human
Being and Should We Change
Our Being?**

Lessons

**Lesson 1: Transhumanism - Biomedical
Intervention and Biomedical Futures**

Lesson 2: Enhancement vs Treatment

**Lesson 3: Revelatory Insight into Enhancing
Our Beings and Human Features**

Unit 4: Human Enhancement & Transhumanism - Are We Changing the Human Being and Should We Change Our Being

- Unit 4 Presentation Slide Deck (scan the QR code to view)
- Lecture Video (Seminar 4) (scan the QR code to view)
- † **Lesson 1: Transhumanism - Biomedical Intervention and Biomedical Futures**
 - [Activity - Transhumanism Video](#)
 - Assessment (Student and Teacher's Edition)
- † **Lesson 2: Enhancement vs Treatment**
 - Activity - Meet the Cyborgs
 - Assessment (Student's Edition & Teacher's Edition)
- † **Lesson 3: Revelatory Insight into Enhancing Our Beings and Human Features**
 - Activity - Video Analysis and Islamic Rewrite (202)
 - [Mandalorian "Fennec's Cybernetic Implants" - Book of Boba Fett \(209\)](#)
 - [Avatar \(part 1\) - Scene From Avatar Number 2. \(209\)](#)
 - [Avatar \(part 2\) - Scene From Avatar Number 1. \(209\)](#)
 - Assessment (Student's Edition & Teacher's Edition)



UNIT 4: HUMAN ENHANCEMENT AND TRANSHUMANISM

Unit 4
Lesson 1:

Lesson 1: Transhumanism - Biomedical Intervention and Biomedical Futures

Time
Length:
45–50 min



NGSS Instructional Outcomes

Next Generation Science Standards

Science and Engineering Practices:

- † Asking Questions and Defining Problems: Students engage in questioning the ethical, moral, and scientific implications of human enhancement and transhumanism.
- † Constructing Explanations and Designing Solutions: The lesson encourages students to construct explanations about the impact of biomedical interventions on the human body and design ethical solutions or guidelines.

Crosscutting Concepts:

- † Systems and System Models: Analyzing the human body as a system affected by biomedical technologies and societal norms.
- † Cause and Effect: Discussing how advancements in biomedical technology can lead to the identification or redefinition of diseases, such as high blood pressure or pre-diabetes.
- † LS1: From Molecules to Organisms: Exploring genetic engineering, biotechnology, and the impact of interventions on human biology.
- † LS4: Biological Evolution: Discussing the concept of human evolution and the idea that humans are an 'unfinished product' in the context of transhumanism.
- † ESS3: Earth and Human Activity: Examining the ethical considerations of altering the human body through biomedical interventions and the societal impacts of these changes.



CCSS Instructional Outcomes

Common Core State Standards

- † Reading Standards for Informational Text: Analyzing informational texts such as religious scriptures, scientific articles, and ethical discussions allows students to build their comprehension skills.
- † Speaking and Listening Standards: Engaging in discussions about complex and controversial topics like human enhancement fosters speaking and listening skills, requiring students to articulate and defend their viewpoints.
- † Integration of Knowledge and Ideas: The lesson integrates religious perspectives (Islamic theology) with scientific viewpoints, promoting a holistic understanding of societal issues.
- † Ethical Reasoning: Engaging in discussions about the moral implications of biotechnological advancements encourages students to reason ethically and consider diverse viewpoints.

Content Learning Outcomes:

1. Identify key components of transhumanist ideology
2. Distinguish between Islamic theological perspectives on human enhancement and its purposes and secular bio-scientific views

Materials:

- † Presentation Slides (Slides 4-24)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Transhumanism: Will humans evolve to something smarter? | A-Z of ISMs Episode 20 - BBC Ideas

Instruction/Teacher Facilitation:

- † In Unit 3, we discussed the pertinent question of “What does it mean to be human” in the context of various views. We determined that a human is not only a body, but also includes the soul, which has consciousness. It is pretty obvious that robots and AI cannot completely replace us, but what about using bioscience and technology to “improve” the human being itself?

SLIDE 5

- † In this Unit, we will explore how notions of human enhancement and transhumanism impact how we think about the use of biotechnology and the practice of medicine; we

will also consider whether, and to what extent, we can/should benefit/improve or “change” human bodies.

- We think that things like cyborgs and robotic parts for humans are science fiction, but the reality is that it is science today. This is no longer the future of science, it is actually present-day practice.
- Bioscientists have devised ways for us humans to live longer and continue to live on this polluted, changing planet.

† We have to start by defining transhumanism and its key components.

SLIDE 6

† If our society validates changes to our being (body and/or soul), then what are our values around such changes? What are our values, from the Islamic tradition, that help us think about whether these changes should be part and parcel of your role as a (future) Muslim physician?

- Are we desiring a future that God warns us against? (We have been warned against desiring immortality and seeking enhanced bodies.)
 - ☒ The warning is against the general idea of becoming “God-like” and that humans are trying to manipulate their bodies to remove mortality (which makes us human) and control our design (which is the purview of God).
 - ☒ This suggests that transhumanistic-like motivations can be linked to such characters in the Qur’an as Pharaoh (which provides a negative/warning-type connotation).

■ Is there a notion of changing our being that Islam validates?

† As we delve into this topic, these are the questions I want you to be thinking about.

Now let us look at the components of this ideology of transhumanism and how it manifests itself.

SLIDE 10

† What is transhumanism? - Scan the QR code to watch Transhumanism: Will humans evolve to something smarter?

- Ask students: “What are some of your initial thoughts on transhumanism and how it looks at our future as humans?”



- Ask students to reflect on the idea [elicit is moral intuition] and on how the idea relates to the previous unit is/lessons on human origin [evolution] and nature [body/mind dualism].
- † Outline what is being presented in this video
 - Essential elements of transhumanism:
 - ☒ Human beings are an 'unfinished product' of evolution
 - ☒ As evolutionary biologists propose, we evolved from homo erectus to homo sapiens, and are now considered the human race.
 - ☒ Many believe that humans are the "final" or the end evolutionary product because of our advanced abilities compared to other animals/organisms, but transhumanists believe that we are an "unfinished product."
 - ☒ Evolution continues as time continues, so we are still evolving, and there might be a "better version" that we can evolve into (but it will also take a long period of time to do so).
 - ☒ One may ask that if we are 'naturally' changing, why not induce changes to speed up or better control that process?
 - ☒ If we induce these changes, perhaps we can select changes that are beneficial and influence what will happen.
 - The goal of transhumanism is to extend ourselves, via bioscience and technology, beyond the limit is of our frail bodies which are susceptible to decline and disease.
 - ☒ To transform humans into a being that no longer has these frailties.
 - ☒ As evolutionary mechanisms were discussed, we see the process of evolution being one that weeds out weak aspects and replaces them with a better functioning version.
 - Some examples of what has been proposed as transhuman changes are: (according to the transhumanistic worldview.)
 - ☒ Incorporating super-functioning body parts into a human being, like making your limbs stronger, perhaps faster.
 - ☒ Uploading the "mind" to a computer or electronic device and by doing so the mind is preserved (where usually there would be a decline in brain function as one ages). - This "mind" could perhaps then be transferred into another

form/body, so that your “essence” or consciousness can be maintained outside of the biological body.

- ❑ Would this mean that the soul was transferred also? (interesting philosophical question)
- ❑ Genetically engineering bodies for better function - genetically altering disease-causing elements of the gene in a manner that eliminates that disease or dysfunction (could also be catered to the environment one lives in).

SLIDE 11 & 12

SLIDE 13

- † Before going further, It would be productive to understand the overarching Islamic view of illness, disease, curing, and healing:

SLIDE 14

- Let us look at what our scriptural text says about it -
- ع In the Qur'an, when Prophet Ibrāhīm (A) is describing Allah SWT and His Power, he explains - وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ - “and when I fall ill, [He] cures me” (Surāh Ash-Shu'araa: 80) - It is Allah SWT who actually cures.
- ع Our beloved Prophet (S) mentioned: مَا أُنْزِلَ اللَّهُ دَاءً إِلَّا أَنْزَلَ لَهُ شِفَاءً (Sahih Bukhari 56:78) “There is no disease that Allah has sent down (created), except that He also has sent down (created) it is healing.” - This Hadīth presents two things. One, that both illness/disease is from Allah SWT and so is the cure. And, two, this Hadīth tells us that the cures for illnesses/diseases do exist and we may be able to discover them.
- ع تَدَاوَوْا عِبَادَ اللَّهِ فَإِنَّ اللَّهَ شُبْحَانَهُ لَمْ يَصْعُ دَاءً إِلَّا وَضَعَ مَعَهُ شِفَاءً إِلَّا الْهَرَمَ (Sunan Ibn Majah 4(31):3436)
- “Seek treatment, O slaves of Allah! For Allah does not create any disease but He also creates with it the cure, except for old age.” - In this Hadīth, the Prophet (S) is specifically telling us to seek treatment. This presents the notion that action is required from us to attain that cure. Interesting to note that the Prophet (S) makes the exception for old age, which denotes that perhaps there is no cure for old age. (Then the question arises, what are the symptoms of “old age.”)
- ع فَخَرَجَ النَّبِيُّ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ فَقَالَ “هُمُ الَّذِينَ لَا يَكْتُمُونَ وَلَا يَسْتَرْقُونَ وَلَا يَنْطَبِرُونَ وَعَلَى رَبِّهِمْ يَتَوَكَّلُونَ” (Jami` at-Tirmidhi 2446)
- “They have never allowed themselves to be treated by cauterization... rather, they have put their trust in God alone.” - (There

is a discussion here of why these people left the available treatment, where the Prophet (S) in the earlier hadīth commands to seek treatment. This gives us the notion that it is not necessary to apply treatment in all cases, there is a spectrum of utility in Islam.) The second part of the equation, as seen here, is trusting in Allah SWT. Seeking treatment, but also trusting that the actual effect of that treatment is under Allah SWT's purview

- We as Muslims have a theistic view of illness/disease because we believe that Allah SWT is in control of both sides of the situation, the illness aspect as well as the cure/treatment aspect. But we have been given a responsibility to do some action (whether it is internal or external) in reacting to a given disease; not only physically seeking cure/treatment, but also having a manner in which one conducts themselves, within the situation, towards Allah SWT, i.e., trusting in Allah SWT, a hoping from Allah SWT for the cure, being grateful, understanding that sins are being removed, etc... And understanding that this trial, which is coming from Allah SWT, has an independent relationship to the outcome.
- It is not the physician that heals, but the normative association that the physician is the avenue that allows for healing to take place through the medicine or actions s/he provides. In reality, the control is with Allah SWT of whether that medicine provides that healing or not.

SLIDE 15

† Therefore, in a more general sense, let us look at doctors and diseases:

- Ask students: What is the relationship between doctors and diseases?
 - ☒ Doctors participate in the process of curing/healing/ameliorating a disease; first diagnosing and then providing a course of treatment (a metaphor of assistance) - The connotation being that the physician is supporting/guiding a patient through this affliction.
 - ☒ Doctors research a disease, their symptoms, and results for the body, and plan a course of action to address these events.
 - ☒ A doctor's job is to combat/fight/terminate the disease; to get rid of the disease completely (a metaphor for fighting) - The connotation here is that the physician is actively try-

ing to eradicate the affliction. “Men against death” as Paul de Kruif authors.

- ☒ "Help" - how would we define the help that a doctor would provide?
- ☒ In the transhumanist ideology, there is a particular connotation embedded in their views, which in turn, alludes to what the role of a physician is.

■ How do you define a disease? (How we define disease matters because the way we define disease will also determine what is the job of a doctor or what we view a doctor as. What are the professional responsibilities of a doctor.) Ask students:

- ☒ Does a child who is born deaf have a disease? And Why?
- ☒ Does a person who is not able to conceive a child have a disease? Why?
- ☒ Did the disease exist before it was researched and defined?
- ☒ Group Discussion - Many students understand disease as a disorder/dysfunction, yet many students will say that a deaf child does not have a “disease” - have students think through this and give their explanation as to why they do not consider this a “disease.”

SLIDE 16

■ Defining Disease - Related yet non-overlapping terms - No singular notion of what disease is, which directly implies that there is no singular notion of what a doctor is/should be aiming to do.

- ☒ Dis-ease - defined by subject - when a person is not at ease
 - ☒ A physician’s role then would be to remove that dis-ease and make them at ease; therefore, it is defined by the subject/person experiencing the dis-ease.
- ☒ Dis-ability - defined by subject and society (tied to flourishing) - when one does not have the ability to function in society or do something that is considered “normal” in society and carry out daily tasks.
 - ☒ A physician’s role then would be to make them be “able” again (if capacity was lost) or to help create tools to augment their abilities to reach a specific norm of ability.
- ☒ Dis-order - defined by society - the “order” is dictated by society, when order in society is disrupted due to a person’s condition, or can be defined by a professional society (i.e., structural order within the body). The body works in a certain

way, we know what eyes are supposed to do- see, the ears are supposed to hear etc...

- ☒ This then means that a physician should work on restoring that order or maintaining that order as defined by society.
- ☒ Dys-function - abnormality or impairment or deviation from norms of physiology or social behavior - this is closely related to the above, but instead of order we ask "Who defines 'normal' physiology and how?"
- ☒ - defined by professionals and society
- ☒ Should all bodies be able to hear and conceive? This is where the discussion comes in of who defines norms, and how they are defined; most norms are defined by certain ideologies of what the function of the person/body as a whole, or part of the person/body, should be.
- ☒ Defining norms also from a theological perspective.
- ☒ NOTE: One's notion of disease or how one defines disease has clear implications as to what a physician believes s/ he should or should not be doing.

SLIDE 17

- † To understand this concept further, let us take the example of height:

SLIDE 18

■ Data Analysis - Charts/Graphs:

- ☒ First chart - of average adult height over a century (100 years) - Ask students: What trend do you see here? - average height is increasing, then plateaus, and also there seems to be a slight dip at the end. Males vs females, males are taller.
- ☒ Height is seen to change over the course of time, it has not been static; still changing.
- ☒ [Key point: Normal distribution of human attributes & capacities can change over time.]
- ☒ Second chart - of average adult height specified by region, and specifically of males (there is a lot more variability seen here) - Ask students: Based on this graph, looking at this data, what do you see happening here? - the average height of males is different based on the region.
- ☒ Around 1930, we see a stark difference. In America, the great depression is happening, in Turkey, there is a lot

of political/economic disorder and turbulence, Saudia Arabia was formally established by King Abdulaziz Al-Saud in 1932 (recording starts after that), and in Malaysia, the economic depression and Chinese immigrant friction shrinks Malay population.

- ☒ Due to the environment or conditions in which these males live, their heights seem to be affected (the chart represents that variability).

SLIDE 19

- ☒ Distribution Curves of Male and Female Height (Bell Curves) -
 - ☒ This is usually called a “normal” distribution curve - but should be referred to as an “average” instead. We discussed earlier about the understanding of “normal” and what that implies.
 - ☒ If we use the term “normal” and you are 2 standard deviations away from the average, you would be considered ab-normal.

SLIDE 20

- ☒ The bio-socio-cultural construction of disease:
 - ☒ In medicine, we use notions of “normality” regularly. Let us look at the example of individual height curves.
 - ☒ When your parents took you to the pediatrician’s office, they were shown these curves - your height and weight at each visit are recorded, and over time, this curve is plotted to see your growth pattern. This is plotted on a curve that contains the average distribution of other children.
 - ☒ As we see here (on the graph with the stature/height), the plotted points are no longer following the curve, this child is falling off the curve and going below the average distribution curve. The doctor would tell the parents that this is abnormal.
 - ☒ ISS - Idiopathic short stature is defined as a disease and quantified by being at least 2 SD off the curve. Idiopathic means that we have no known cause for the person’s lower-than-average height; so short stature is considered a disease. Therefore, that means doctors should address this issue, and treat/cure/ameliorate this problem.
 - ☒ Why has this been considered a problem? Because according to society, or others in your region, this is not

“normal” and there are harms that may fall upon the person if they are too short (see impacts below).

- ☒ So this is an example of the Sociocultural construction of disease.
- ☒ Physiologically, this has been identified by the doctor, but are there any social harms of this? Especially because we are saying that this is an example of society and culture establishing or defining what a disease is.

SLIDE 21

- ☒ Impact of short stature - a study of the harms of short stature using varied metrics, done in the UK with a biobank of almost 200,000 people.
- ☒ Results:
 - Taller men are associated with a higher level of mean education, which in turn is associated with higher incomes.
 - Other sociological data:
 - Shorter kids - Prone to bullying due to their size, which leads to psychological impacts (confidence, inferiority complex, etc...)
 - Shorter men & Taller women → Fewer romantic prospects (because it goes against norms of society; the norm is to have taller men and women who are shorter than those men)

SLIDE 22

- † A doctor's job is now presumed to be to fix this “problem.”
 - ☒ According to a physiological perspective, as seen on the growth curves, and from a sociocultural perspective, this is an issue, and we should use biotechnology to fix that.
 - ☒ Data on giving growth hormones - no long-term studies/ data that this addresses all the potential harms - a lot of uncertainty but doctors have seen benefit in some cases.
 - ☒ This is treating a “disease” without any known causes.
 - ☒ Some adults have gone to more evasive procedures, where leg bones are broken, then adjustments are made to then lengthen them, for that height increase.

SLIDE 23

† Biomedical technology allows us to see “diseases” that were not considered diseases before. Ask students:

- ☒ Would there be such a thing as high blood pressure as a disease if we did not have the blood pressure cuff/sphygmomanometer? Did high blood pressure actually exist?
 - ☒ Yes, because we saw the symptoms, effects, or outcomes of it. BUT, the tool for measuring the cause of this disease did not exist earlier, therefore, the labeling and the association of cause and effect of this particular disease was not present. Now that we have the tool, the blood pressure cuff, there is an identification of this disease, an association of symptoms to it is results/effects, which is now known as high blood pressure.
 - ☒ Would being childless be considered a disease? What if there were no artificial reproductive biotechnologies?
 - ☒ No, childlessness is not a disease; see verses: (42:49–50); some people are created 'barren' by Allah [SWT]. Having children is a gift, not a right, and the lack of children does not diminish one's humanity.
 - ☒ So infertility is a condition/state but not a disease demanding remedy from a theological standpoint.
 - ☒ Yet, not having children could be seen as abnormal in some cultures/societies and thus could ground the label of disease.
 - ☒ Can you think of an example of a disease that “came into existence” due to biomedical technologies?
- Student answers will vary
- ☒ E.g., onset of diabetes - Before the advent of accurate blood glucose measurement tools, the spectrum of blood sugar levels between normal and diabetic wasn't as well-defined. With improved glucose monitoring, medical professionals can now identify individuals with blood sugar levels higher than normal but not high enough to be classified as diabetes. This recognition has led to interventions and lifestyle changes aimed at preventing or delaying the onset of full-blown diabetes, potentially averting complications.

SLIDE 24

† In summary:

- Diseases are variably defined (4 D's)
- Bioscience can define a disease based on the idea of the 'normal' spectrum of physical or social attributes and assess the harms of those abnormalities.
- Biomedicine can then develop treatments to address that condition/malady
- Human bodies are changing
 - ⊠ Normality changes over time & across space
 - ⊠ Claim = empirical proposition based on probabilistic/zannī knowledge

Unit 4: Lesson 1 - Assessment

Section 1: True or False - Indicate whether each of the following statements are TRUE or FALSE.

3. The following activities are consistent with transhumanism:
 - a. TRUE FALSE Uploading one's brain into computer neural networks
 - b. TRUE FALSE Genetically modifying one's DNA to enable one to breathe in low-oxygen environments

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

4. Transhumanism advocates for:
 - a. Keeping human evolution strictly natural
 - b. Using science and technology to surpass human biological limitations
 - c. Rejecting all forms of medical intervention
 - d. Maintaining current human conditions without changes
5. According to Islamic theology, who is the ultimate source of healing?
 - a. The doctors
 - b. The patients themselves
 - c. Allah SWT
 - d. Medical technology

†

6. Which of the following is NOT an example of a potential transhuman change?
 - a. Uploading the mind to a computer
 - b. Genetically altering genes to prevent diseases
 - c. Undergoing an ACL repair surgery
 - d. Incorporating super-functioning body parts

Section 3: Short Answer - Write a well-formulated response for each of the following.

7. Explain the concept of "human beings as an unfinished product" from a transhumanist perspective.

8. How does the Islamic view of illness and healing differ from a purely scientific perspective?
9. Discuss the ethical implications of defining diseases based on societal norms and the role of physicians in this context.
10. In the context of transhumanism, what are the moral limits that should be considered, especially from an Islamic viewpoint?
11. Reflect on the idea of “changing creation” in the light of biomedical enhancements. Discuss the potential benefits and drawbacks of such changes.
12. How do biomedical technologies influence our definition of what is considered a ‘normal’ human condition?

Unit 4: Lesson 1- Assessment (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements are TRUE or FALSE.

1. The following activities are consistent with transhumanism:
 - a. > **TRUE** FALSE Uploading one's brain into computer neural networks
 - b. > **TRUE** FALSE Genetically modifying one's DNA to enable one to breathe in low-oxygen environments

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

2. Transhumanism advocates for:
 - a. Keeping human evolution strictly natural
 - b. *Using science and technology to surpass human biological limitations •*
 - c. Rejecting all forms of medical intervention
 - d. Maintaining current human conditions without changes
3. According to Islamic theology, who is the ultimate source of healing?
 - a. The doctors
 - b. The patients themselves
 - c. *Allah SWT •*
 - d. Medical technology
4. Which of the following is NOT an example of a potential transhuman change?
 - a. Uploading the mind to a computer
 - b. Genetically altering genes to prevent diseases
 - c. *Undergoing an ACL repair surgery •*
 - d. Incorporating super-functioning body parts

Section 3: Short Answer - Write a well-formulated response for each of the following.

5. Explain the concept of "human beings as an unfinished product" from a transhumanist perspective.

- † *The transhumanist view sees human evolution as a continuing process and believes that with the help of technology and science, humans can evolve further, surpassing current biological limitations, and in less time.*
- 6. How does the Islamic view of illness and healing differ from a purely scientific perspective?
- † *An Islamic view incorporates a belief in divine will and power in healing, along with encouraging the pursuit of medical treatment, whereas a bioscientific lens focuses only on biological and social functioning as sources of disease and relies on 'fixing' these mechanisms to restore health.*
- 7. Discuss the ethical implications of defining diseases based on societal norms and the role of physicians in this context.
- † *Diseases defined by societal norms can lead to ethical dilemmas, as what is considered 'normal' can vary. Physicians play a crucial role in this by determining what conditions require medical intervention, often influenced by these societal norms.*
- 8. In the context of transhumanism, what are the moral limit is that should be considered, especially from an Islamic viewpoint?
- † *Students should consider ethical boundaries such as playing God, altering human nature, and the potential social implications of such technologies.*
- † *The purpose of any changes also needs to be considered; whether it is a genuine medical need/recommendation, or if it is not a medical need, which would then be considered unnecessary changes/enhancement.*
- 9. Reflect on the idea of “changing creation” in the light of biomedical enhancements. Discuss the potential benefit is and drawbacks of such changes.
- † *The discussion should balance the potential for improved quality of life with ethical considerations, religious viewpoints, and concerns about modifying the human being beyond the limit is of normal human functioning.*

10. How do biomedical technologies influence our definition of what is considered a 'normal' human condition?

† *This question encourages students to think about how technology not only provides solutions but also shapes our understanding of health and normality, potentially leading to new categories of diseases or conditions.*

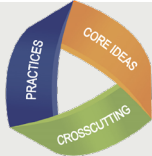
UNIT 4: HUMAN ENHANCEMENT & TRANSHUMANISM

Are We Changing the Human Being and Should We Change Our Being?

Unit: 4
Lesson: 2

Time
Length:
45–50 min

Lesson 2: Treatment vs Enhancement



NGSS Instructional Outcomes

Next Generation Science Standards

Science and Engineering Practices:

- † Asking Questions and Defining Problems: Students explore and define the distinction between enhancement and treatment in the context of human enhancement.
- † Engaging in Argument from Evidence: Debating whether certain biomedical interventions fall under treatment or enhancement requires students to use evidence and reasoning.

Crosscutting Concepts:

- † Cause and Effect: Understanding the effects of biomedical interventions and their classification impacts societal norms and individual health.
- † Systems and System Models: Analyzing the human body as a system affected by biomedical technologies.
- † LS3: Heredity: Inheritance and Variation of Trait is: Exploring how genetic modifications and enhancements could impact human heredity and genetic diversity.
- † LS4: Biological Evolution: Discussing transhumanism in the context of human evolution and the potential for future human development.
- † ETS1: Engineering Design: Considering the design and ethical implications of biomedical technologies used for enhancement.



CCSS Instructional Outcomes

Common Core State Standards

- † CCSS.ELA-LITERACY.RST.9-10.8: Assessing the credibility of the sources (like the CNN article) and noting any discrepancies among the data or information presented.
- † CCSS.ELA-LITERACY.SL.9-10.1: Engaging in collaborative discussions, building on others' ideas, and expressing their own clearly and persuasively.

Mathematics Standards:

- † Statistics & Probability: Interpreting data, such as the effects of certain biomedical interventions, and understanding the statistical norms and deviations that might apply in the context of human enhancement.

History/Social Studies Standards:

- † CCSS.ELA-LITERACY.RH.9-10.2: Determining the central ideas or information of a primary or secondary source; provide an accurate summary of how key events or ideas develop over the course of the text.
- † CCSS.ELA-LITERACY.RH.9-10.9: Comparing and contrasting treatments of the same topic in several primary and secondary sources.

Content Learning Outcomes:

- † Identify key components of transhumanist ideology
- † Discern transhumanism-based narratives and elements within popular media
- † Distinguish between Islamic theological perspectives on human enhancement and its purposes and secular bio-scientific views

Materials:

- † Presentation Slides (Slides 25-28)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † CNN Article: [Transhumanism: Meet the cyborgs and biohackers redefining beauty](#)

Instruction/Teacher Facilitation:

- † In the last lesson, we discussed the key components and ideas of transhumanism. Let us now look deeper at how changes are being made and to what extent should we benefit/improve or “change” human beings.

SLIDE 25

- † Therapy vs Enhancement

■ Three views on differentiation

1. Medical practice vs. non-medical practice -
 - ⊠ Whatever doctors/allied health professionals do as licensed practitioners is considered therapy.
 - ⊠ Non-medical practices are not therapy; if not prescribed by a doctor or a health professional, it is not considered therapy.
2. Restoring to normal function vs. augmenting function
 - ⊠ If something creates equality of opportunity in society = therapy
 - ⊠ Whatever removes dysfunction/dīsābility and restores normal functioning so that a person can then continue to have that equal opportunity would be considered therapy. (Restoring a species-typical function is the goal of therapy.)
 - ⊠ Anything more than this would be considered enhancement.
3. Treatments address maladies while enhancements target normal function/being
 - ⊠ If improving function beyond the species-specific norm of biological function = enhancement
 - ⊠ For someone who is on the normal curve in their functioning and wants to be taller than that normal height; this would be an enhancement.
 - ⊠ Comparatively, if a person is off or below the normal curve, and they want to get back onto that normal curve, anything done in such a case would be therapy.

SLIDE 26

† Group Thought/Discussion Activity: Enhancement vs Therapy Case Examples

- Introduce these 3 case examples:
- Tommy John Surgery - a surgery to repair the ulnar collateral ligament (UCL), which tears due to overuse, usually in athletes that use their elbow a great deal, like pitchers. While playing for the Los Angeles Dodgers in 1974, Tommy John injured his UCL and became the first person to undergo ulnar collateral ligament (UCL) reconstruction surgery, in which a tendon from another part of the body (often from the forearm or hamstring) is taken to replace the damaged ligament in order to restore stability and function. When the surgery was successful and he returned to major league baseball, the surgery was named after him.
 - ⊠ After surgery, in the recovery stage of the first year, people are not able to use their elbow to it is full potential, like throwing the baseball as fast as they used to, but after that recovery stage, they are often able to throw the ball faster than they used to . because the replacement 'ligament' is stronger than the original.
- LASIK eye surgery - most commonly performed laser refractive surgery to correct vision problems. During LASIK surgery, a special type of cutting laser is used to change the shape of the cornea. LASIK often offers improved vision without the hassle of glasses or contact lenses. In general, there is a good chance of achieving 20/40 vision or better after refractive surgery.
- NuClarity - a brain supplement that helps improve cognitive function by increasing neurotransmitter efficiency which will in turn boost memory retention, clarity, and information recall. It claims to reduce brain fog and increase cerebral blood flow.
- Instruct students: Within your groups come to a consensus on whether each of these cases is an example of therapy or enhancement, and be able to explain why. (Allot about 7-10 minutes for students to discuss and come to a conclusion within their groups.)
- Have a student representative from each group report their decisions to the whole class.

- ☒ Be sure each group presents their decisions along with their reasoning as to why they came to that decision concerning each example.
- ☒ Reinforcement of concepts as they report back

■ Results:

4. Tommy John Surgery -

- ☒ Therapy - because surgery was needed to restore function. The beneficial side effect is that the surgery actually improved function more than normal. The status of the person who was subject to the therapy was someone who had a dysfunction due to the torn tendon.
- ☒ Enhancement - because the ligament commonly used to replace the torn ligament is taken from the leg which is usually thicker than an arm ligament, therefore it is stronger and enhances functioning post-surgery. Also, the torn ligament is caused due to consistent stress or use on that elbow, where a person could change profession and avoid the need for this surgery. It is their desire to be a pitcher, and not a need. The normal population does not use the elbow to this degree, so the "normal" use threshold is well below this.

5. LASIK Surgery -

- ☒ Therapy - because trying to restore vision from impaired or blurred vision to clear vision.
- ☒ Enhancement - because it is normal to have visual impairments as one ages, so bad eyesight is actually the norm, especially at older ages.
- ☒ Question to consider: Why are we changing the body part, instead of changing/fixing the environmental causes of this decreased ability to see? Like the lights and types of lights that are used, the screens and their configuration that is harmful to our eyes and play a part in their deterioration.

6. NuClarity -

- ☒ Enhancement - because it is being used to boost cognitive functioning, not restore or bring to a normal level from an impaired or decreased level.
- ☒ Therapy - because if a person is required to memorize and internalize facts, the brain will have information

overload. But society expects you to know these things, so to attain or maintain societal expectations and do well at school/workplace, this supplement will help a person be within that expected “norm.”

- Results Analysis - Students can argue either way for each of these, and the teacher should challenge their decision with the alternative to push their reasoning and allow them to see that the decision whether something is therapy or enhancement can be justified either way.

SLIDE 27

† Summary

■ Transhumanism

- ☒ Transitional state of human - post-human
- ☒ Goal is to remove human frailties
- ☒ Utilize biotechnology to do so

■ Disease

- ☒ Definitions vary culturally and over time
- ☒ Can be functionally based; teleology-based (fulfilling it is purpose of creation); subjectively-based
- ☒ Healthcare addresses for creation these societally-based ‘needs’
- ☒ There is a ‘normal’ curve to human capacities - but this is a value judgment because it can change over time
- ☒ Enhancement vs. treatment/therapy can be difficult to differentiate at times

SLIDE 28

† Culminating Group Activity: Real-life Case Analysis

- Have the students read the CNN article: Transhumanism: Meet the cyborgs and biohackers redefining beauty (scan the QR code to read the article)
- Group students and have them pick a person from this article to look up and find out more about. OR Group students based on the person they are interested in learning more about.
- Students must:



- ☒ Look up the story behind the person that was chosen.
- ☒ Analyze their case in terms of concepts you learned today (Physician's responsibilities, Enhancement vs Therapy/Treatment). Would you have made those modifications to this individual, as a Muslim physician? Why?
- ☒ Share with the rest of the class - the case of the individual and if you would perform the procedure for the modifications with reasons.

Unit 4: Lesson 2 - Assessment

Section 1: True or False - Indicate whether each of the following statements is true or false.

1. Tommy John Surgery can be considered both therapy and enhancement. TRUE FALSE
2. LASIK surgery is solely considered therapy. TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. The most appropriate distinction between therapy and enhancement is:
 - a. Therapy is what doctors do within the healthcare system while enhancement is what non-medical professionals do outside of the healthcare system.
 - b. Restoring function is the goal of therapy while augmenting function is the goal of enhancement.
 - c. Therapy targets normal function while enhancement targets disease states.
4. Enhancement in the context of transhumanism primarily refers to:
 - a. Restoring normal human functions
 - b. Exceeding typical human abilities
 - c. Rejecting all forms of medical intervention
 - d. Maintaining current human conditions

Section 3: Short Answer - Write a well-formulated response for each of the following.

5. Explain the difference between enhancement and therapy in medical terms.
6. Discuss the role of a physician from an Islamic perspective in deciding between therapy and enhancement.

Unit 4: Lesson 2 - Assessment (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements are true or false.

1. Tommy John Surgery can be considered both therapy and enhancement. > **TRUE** FALSE
2. LASIK surgery is solely considered therapy. TRUE > **FALSE**

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. The most appropriate distinction between therapy and enhancement is:
 - a. Therapy is what doctors do within the healthcare system while enhancement is what non-medical professionals do outside of the healthcare system.
 - b. **Restoring function is the goal of therapy while augmenting function is the goal of enhancement. •**
 - c. Therapy targets normal function while enhancement targets disease states.
4. Enhancement in the context of transhumanism primarily refers to:
 - a. Restoring normal human functions
 - b. **Exceeding typical human abilities •**
 - c. Rejecting all forms of medical intervention
 - d. Maintaining current human conditions

Section 3: Short Answer - Write a well-formulated response for each of the following.

5. Explain the difference between enhancement and therapy in medical terms.

Enhancement aims to exceed typical human abilities or improve upon the natural human condition, whereas therapy aims to restore or maintain normal human function.

6. Discuss the role of a physician from an Islamic perspective in deciding between therapy and enhancement.

From an Islamic perspective, a physician must balance the ethical considerations of intervention, considering the well-being of the patient, societal norms, and religious teachings. The intent and outcome of the procedure play a crucial role in this decision-making process.

UNIT 4: HUMAN ENHANCEMENT AND TRANSHUMANISM

Are We Changing the Human Being and Should We Change Our Being?

Lesson 3: Revelatory Insight into Enhancing Our Beings and Human Features



NGSS Instructional Outcomes

Next Generation Science Standards

Science and Engineering Practices:

- † Asking Questions and Defining Problems: Students explore the ethical and philosophical questions raised by human enhancement technologies.
- † Engaging in Argument from Evidence: Debating the merit is and drawbacks of transhumanism based on religious, ethical, and scientific evidence.

Crosscutting Concepts:

- † Cause and Effect: Understanding how advancements in technology can have profound effects on society and human identity.
- † Systems and System Models: Analyzing the human body and society as systems that are impacted by technological advancements.
- † LS4: Biological Evolution: Examining the concept of human evolution in the context of transhumanism and contrasting it with religious views.
- † ETS1: Engineering Design: Considering the implications of designing technologies that alter human capabilities and the ethical boundaries involved.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards:

- † CCSS.ELA-LITERACY.RST.11-12.1: Citing specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.
- † CCSS.ELA-LITERACY.SL.11-12.1: Engaging effectively in a range of collaborative discussions on complex topics, texts, and issues.

History/Social Studies Standards:

- † CCSS.ELA-LITERACY.RH.11-12.7: Integrating and evaluating multiple sources of information presented in diverse formats and media in order to address a question or solve a problem.
- † CCSS.ELA-LITERACY.RH.11-12.9: Comparing and contrasting treatments of the same topic in several primary and secondary sources.

Content Learning Outcomes:

- † Identify key components of transhumanist ideology
- † Distinguish between Islamic theological perspectives on human enhancement and its purposes and secular bio-scientific views
- † Apply scriptural and scientific concepts to evaluate the uses of biomedical technologies to 'change' the human body

Materials:

- † Presentation Slides (Slides 29-39)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Video Clips for Activity: (Scan QR code to watch videos)
 1. Mandalorian - "Fennec's Cybernetic Implants" - Book of Boba Fett So1Eo4 Clip - 4k - <https://youtu.be/14RsOGZcfnU>
 2. Avatar (the first one) - Scene From Avatar Number 2 - <https://youtu.be/7ogLskyjxwc>
 3. Avatar (to be shown in connection with previous scene) - <https://youtu.be/eoGowLIHck>



Instruction/Teacher Facilitation:

- † In this unit, so far, we have discussed the concept of transhumanism and further discussed the elements of treatment/therapy versus enhancement, which are all aspects of changing the human body. We looked at the elements of transhumanism earlier, and now we will look at the ideology behind transhumanism. There are some fundamental ideas behind transhumanism of what a human being actually is, and what the purpose of a human is. These ideas define the way that transhumanism takes shape and what these scientists believe can and should be done. Today's goal is to identify those ideas backing transhumanism and see if, and how, these ideas match up with Islamic values and principles.

SLIDE 29

- † How Do You Think This Verse Relates to Transhumanism?

فَوَسْوَسَ لَهُمَا الشَّيْطَانُ لِيُبْدِيَ لَهُمَا مَا وُورِيَ عَنْهُمَا مِنْ سَوْآتِهِمَا وَقَالَ مَا نَهَاكُمَا رَبُّكُمَا عَنْ هَذِهِ الشَّجَرَةِ إِلَّا أَنْ تَكُونَا مَلَكَائِينَ أَوْ تَكُونَا مِنَ الْخَالِدِينَ ۝

■ “Then Satan whispered to them that he might manifest unto them that which was hidden from them of their shame, and he said: Your Lord forbade you from this tree only lest you should become angels or become of the immortals.” (Surāh Al-A’raaf 7:20)

- ☒ Transhumanism is working towards a post-human that can live forever.
- ☒ The introductory video about transhumanism from the previous lesson mentioned that the goal of transhumanism is to improve humans so that we become “fitter” - in the context of humans being a product of evolution.
- ☒ The ideology of transhumanism is in the context of a specific view of the human, and the purpose of a human being's life, as well as an outlook at the future of humans.
- ☒ This is seen in movies and books that have transhumanistic assertions in their stories.
- ☒ In this verse, Shaytan tells Adam (A), to do this and you'll live forever.
- ☒ Humans have a fear or hesitation for death, and, therefore, many humans want to live longer or even forever..
- ☒ However, death is something that is a certainty as the Qur'an and history tell us. Moreover, it is something that is not inherently negative, it is just a transition point from one phase of life to another.

SLIDE 30

† Looking at the Journey of our souls (as we looked at in previous Unit is):

■ We know that our soul goes through various stages (4 general stages)

1. Life of Souls - We were souls without bodies.
2. This Life - Our souls were breathed into our bodies.
3. In the Grave - Our souls will separate from our bodies and our bodies will decay, as our soul moves on.

Revelatory Evidence: "Every soul shall taste/experience death." (Surāh Ali-Imraan:185) - here it says that every soul shall "experience" death.

4. The Afterlife - Our souls will be reunited with our resurrected bodies.

■ This framework gives us a framework of human existence, and therefore also puts into perspective the transhumanistic ideas of self-improvement and enhancement.

- ☒ The purpose of a human being comes from an understanding of who we are as humans.
- ☒ Who we are as humans:
 - ☒ Not products of an evolutionary process - we are souls that began by Allah's (SWT) command and came into existence.
 - ☒ We were put into a body, on this earth, for a temporary time.
 - ☒ We will indeed die
 - ☒ We will then later be resurrected

SLIDE 31

† So these two views of on humans, the transhumanistic view and the Islamic view, bring up certain pertinent questions: [Have students discuss these questions and come up with their answers and reasoning for each of their answers.]

■ 1. What does it mean to make humans better? - the answer to this question will be different based on what you think the purpose of a human being is.

- ☒ If you think that a human being's purpose is to maximize personal pleasure and try to live forever, then you will have a particular vision of how to make human beings better.

- ☒ If you think that human beings are a body and a soul and that death is a looming reality, and the purpose of this life is to maximize what we do in this life for the sake of or in preparation for another life, then you will have a different perspective on how to make human beings better.
- ☒ Then also, the use of transhumanism or its goal is changed as well.
- ☒ Perhaps it is focused on trying to make the spiritual experience better or making some changes that make obedience to Allah's commands easier etc...

■ 2. Will we be able to make humans better?

- ☒ If a human being is just a material body, then the functioning of the human body becomes the most important aspect of the human, and the focus will be to make it functionally better. (Making the body stronger, impervious to disease etc..).
- ☒ BUT this view ignores/missing a whole part of the human being which is the consciousness, the soul, and spiritual states.
- ☒ If a human being is defined by the body AND a soul, then the focus of improvement will be metaphysical in nature, as well as physical.

■ 3. Will humans be able to live forever?

- ☒ Again, this goes back to the fundamental belief of how a human being is defined.
- ☒ From an Islamic perspective, this is an easy question, but how exactly is that "forever" life or what does that look like will play a part in how a person enhances themselves.

SLIDE 32

† Let us look at some verse of the Qur'an that would help us answer these questions:

- On the idea of changing Allah SWT's creation - Allah SWT says in the Qur'an: "... they pray to none else than Satan, a rebel whom Allah cursed, and he said: Surely I will take of Your servants an appointed portion, and surely I will lead them astray, and surely I will arouse desires in them, and surely I will command them and they will cut the ears of cattle, and surely I will command them and they will change Allah's creation. Whoever chooses

Satan for a patron instead of Allah is verily a loser and his loss is manifest.” (Surah As-Nisa 4:117-119)

- Human beings are one of the creations of Allah SWT. So changing human beings would also be an element of what is being warned against in that Satan would inspire humanity to change it itself.
- This differs from transhumanistic thought because, remember, they believe that humans are part of an evolutionary process, not a formed creation of Allah SWT.
- Shaytan is saying that he will command human beings to change the creation of Allah SWT.
 - ☒ The context of this verse is referring to the pagans, polytheists of Makkah, who used to do consecrate/make sacred certain animals, and then to show this, they would do things like slit the ears of these animals and do other things that would qualify as “changing the creation of Allah”.
 - ☒ Various ahadīth also testify and apply this concept to human beings changing themselves.
 - ☒ Because this “changing” is a command or influenced by Shaytan, the Islamic jurists have stated it is impermissibility (again, along with proofs from these ahadīth).
- A highly oversimplified summary of this concept, not to get into the details of what is permissible or impermissible, but for us to exercise that higher-level thinking, is:
 - ☒ It is unlawful to beautify a human being by effecting significant, permanent change, but medical treatment is permissible.
 - ☒ E.g., cutting your hair to look nice is not considered a significant change, nor a permanent change because your hair grows back.
 - ☒ E.g., purposefully breaking your legs to enhance the human being and making them more beautiful, in this case to make yourself taller, would be considered a significant, permanent change; and this would be considered impermissible.
 - ☒ Nevertheless, medical treatment is permissible. So if someone broke their leg, because of some accident, and surgery was needed to repair that leg; this would be permissible.
 - ☒ E.g., cosmetic surgery for mere beautification would be impermissible, yet cosmetic surgery due to disfigurement of the face would be permissible because it would be considered medical treatment.

- This is not a straightforward rule, there are a lot of complexities here that are considered, so this rule is a generalization and an overarching principle, but exceptions to this can be made based on circumstances.
- ⊠ There are complexities in trying to figure out what treatment is, what a disease is, when it is therapy, and when it is enhancement. These are all questions that the Islamic jurists discuss with doctors in order to come to conclusions about each individual case.
- ⊠ But from a higher level, overall perspective, we want to have this viewpoint that this is how Allah SWT has created us as human beings, and it is impermissible to “change” ourselves in a way that is significant and permanent, with the exception of medical treatment.

SLIDE 33

- † Relate this concept back to the 3 cases seen in Lesson 2- Tommy John Surgery, LASIK eye surgery, and NuClarity use. Ask students: Would you change your view now of what you thought about these surgeries before?

SLIDE 34

- So we have established that Allah SWT has created us, and now we see that He has created us in the best of forms.
- ⊠ Allah SWT says: لَقَدْ خَلَقْنَا الْإِنْسَانَ فِيَّ أَحْسَنَ تَقْوِيمٍ “ ... Surely We created man in the best form.” (Surāh At-Tīn 95:4)
- ⊠ The concept that Allah SWT has created us in the best way for our optimal or proper function.
- ⊠ E.g., the purpose of the ear is to hear, the purpose of the eye is to see, so the anatomy follows the physiology of the body part. Although the ear's function is to hear, sometimes Allah SWT creates people who are deaf, with His infinite wisdom.
- ⊠ But what about the entire/whole/complete human being? What is the purpose of a human being it itself? The purpose of the human being is to know Allah SWT, to worship Him, and to love Him.
- ⊠ So the “best” form of the human being is not the strongest, fastest, insusceptible to disease, lives forever, etc... It is the form that best fulfills this purpose of knowing and worshiping Allah SWT. This is in reference to not just the bodily form, but the best spiritual form as well

(the *fitrah* = the form of the soul). The spiritual form can change when we purify it (be grateful and humble etc..), and can be distorted when we allow exposure to sin for example shirk, lying, and showing off. Therefore, humans have been created with the best potential to freely choose to worship Allah SWT (but that potential is not always realized).

- ثُمَّ رَدَدْنَاهُ أَسْفَلَ سَافِلِينَ. “But We will reduce them to the lowest of the low” (Surāh At-Tīn 95:5) is what happens when this potential of our human existence is not fulfilled or realized.
- ⊠ This also aligns with the concept in Islam, that all the Sharī’ah rules we have are for our benefit; that Allah SWT wants us to benefit and therefore these things are put in place to benefit us. Consequently, doing these things, that we are being told to refrain from, will cause us harm. So, changing the human being in a significant and permanent way is forbidden, and will harm us.

SLIDE 35

■ No Immortality in this Life

- ⊠ كُلُّ نَفْسٍ ذَائِقَةُ الْمَوْتِ “Every soul will, without doubt, fully experience death.” (Surāh Al-Ambiyāa 21:35)
- ⊠ It is part of our *īmān* to believe in death; death is a reality of life. Every single human being will die. And death is defined as the removal or separation of the soul from the body; a transfer of our soul from one realm of existence into another realm of existence.
- ⊠ Death gives our lives purpose; it makes our lives meaningful. There is a time limit to life and consequences for our actions in the hereafter.
 - If a person lives a life of pain and suffering, and they are patient and believes in a life after death, in which they will be rewarded for their suffering and patience, then this life and the difficulties that they are experiencing become eternal bliss in the next life; therefore this suffering becomes meaningful and purposeful.
 - If a person dies and that’s it, there is no afterlife, and they suffer calamities in life, then human existence becomes depressing and lacks purpose. Why would

anyone want to continue to live (if they have to go through difficulty for no reason, no purpose)?

SLIDE 36

- But there is immortality in the next life.
 - ❑ The belief in something coming after death gives life purpose. And not just life, but an eternal life, an immortal life.
 - ❑ حَرَّآؤُهُمْ عِنْدَ رَبِّهِمْ حَتَّىٰ تَعْدَنَّ تَحْرَىٰ مِنْ تَحْتِهَا الْأَنْهَارُ خَالِدِينَ فِيهَا أَبَدًا رَضِيَ اللَّهُ عَنْهُمْ وَرَضُوا عَنْهُ ذَلِكَ لِمَنْ خَشِيَ رَبَّهُ "Their reward is with their Lord: Gardens of Eden underneath which rivers flow, wherein they dwell forever. Allah is pleased with them and they are pleased with Him." (Surāh Al-Bayyinah 98:8)
 - ❑ Immortality is in the next life, not here. If we ignore this and expand life here on earth, there is only so far that we can go.

SLIDE 37

† Culminating Group Activity:

- Divide the students into groups and assign a video clip to them.
- Instructions:
 - ❑ Identify transhumanist elements in the following video clips
 - ❑ Rewrite the stories to make them more Islamic/ align with Islamic theology (rewrite any un-Islamic notions to make them follow the guidelines presented). (Give the students about 15–20 minutes to do the rewrites.)
- Note: This activity can be done as a homework assignment or a class activity.
- Have each group present their identification of the transhumanist elements and their Islamic rewrites.
- The class will vote on the best stories after all the groups have shared their rewritten stories.
- Video Clips: (Scan QR codes to view videos)
 - ❑ **The Book of Boba Fett - 2 moral agents here, the patient and the doctor**
 - ❑ Avatar (the first one) - Jake Sully, the main character, is about to enter the pod
 - ❑ Scene From Avatar Number 2.
 - ❑ And now he has been uploaded into his new body



SLIDE 38

- Transhumanist elements present in each clip (a guide for teachers - these are the transhumanist elements that students can point out) -
 - ☒ The Book of Boba Fett - Note Boba uses the word 'modification' which is a neutral term related to enhancement. Then he says 'This woman is dying' and he brings her to the shop to regain life [the idea of immortality in transhumanism]. The 'doctor' has cybernetic implants so he can perform body modifications better. The idea of doctors being technicians and serving the customer (seen by him seeing the money bag and saying 'You should have said that first').
 - ☒ Avatar - Note the language when the protagonist who cannot use his legs says something to the effect 'I have lived my life not dealing with what doctors say I cannot do' which again represents moving beyond medicine. The entire video clip demonstrates mind uploading. Note the language that the technician uses, such as that is a 'gorgeous brain' speaking of the protagonist's brain as it is 'phasing' with the Avatar. Then it moves beyond the brain substrate as the mind is uploading to a new body and the staff says 'Welcome to your new body.'
- Islamic Rewrites (a guide for teachers as to what Islamic elements to incorporate into the rewritten versions of these video clips)
 - ☒ Examine the intentions with which the actions are being done; include intent for the ākhirah.
 - ☒ Add virtue to actions so that it is not just a physical action but one that transcends the physical and has metaphysical elements, i.e., reward for good deeds and sin for forbidden actions, virtue in struggling and overcoming the difficulty, perseverance and patience.

SLIDE 39

- † Deeper Reflection and Changing the Underlying Narrative
 - In the past, storylines usually included someone who struggled with something in life (growing up as an orphan, having an ill family member who needed specialized care and the effect of that on the people around him/her, or a close family member dying of an incurable disease) and how they overcame that

difficulty and became incredibly good/moral people. The audience is, in turn, moved by this human experience.

■ In all of these storylines, we see an underlying theme, that whenever something bad/harmful happens to a human being, they do not have to worry, they can just get some modifications made to their body (turned into a robot, or mechanical body parts) so that they can be fixed up in a way that will make them live forever. This is transhumanist ideology at its core. Where is the struggle? Where is the human experience of overcoming difficulties? When this transhumanist ideology is put into people's minds, then when real difficulty comes that cannot be "fixed" in real life, they do not know how to deal with that, grow with that, and become a better person as a result of that.

■ So, this underlying aspect, a deeper narrative of acceptance, gratitude and doing something great with what a person is given would have made these clips more Islamic. There should be a reflection of what is the purpose of our human existence, what a human being actually is, and portraying our Islamic values which needs to be brought into the recasting/analysis of these clips.

Unit 4: Lesson 3 - Assessment

Section 1: True or False - Indicate whether each of the following statements is **TRUE** or **FALSE**.

1. Revelatory knowledge tells us the following:
Satan entices humankind to seek immortality **TRUE** **FALSE**
2. Transhumanism aligns closely with Islamic views on life and death. **TRUE** **FALSE**
3. Islamic teachings generally consider significant, permanent changes to the human body for enhancement purposes as impermissible. **TRUE** **FALSE**

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

4. According to transhumanist ideology, the ultimate goal of enhancing humans is to:
 - a. Maintain traditional human values
 - b. Achieve a longer lifespan and superior abilities
 - c. Return to a more primitive state of human existence
 - d. Ensure adherence to religious doctrines
5. In Islamic theology, modifying the human body for enhancement is:
 - a. Encouraged for all purposes
 - b. Generally considered impermissible unless medical need is expressed by medical professionals
 - c. Absolutely forbidden
 - d. Only allowed for medical professionals

Section 3: Short Answer - Write a well-formulated response for each of the following.

6. Explain how transhumanism and Islamic theology differ in their views on human enhancement.
7. Discuss the Islamic perspective on altering the human body in the context of medical treatment vs. enhancement.

and the natural human lifecycle, including the inevitability of death and the afterlife.

7. Discuss the Islamic perspective on altering the human body in the context of medical treatment vs. enhancement.

† *Islamic bioethics and law allows altering the human body for medical treatment to restore normal function but generally views significant and permanent enhancements for aesthetic purposes or non-medical purposes as impermissible.*

UNIT 5:

Are We Programmed or Do We Have Free Will?

**Discussions on Fate and
Genetic Determinism**

Lessons

**Lesson 1: Islamic View on Free
Will & Determinism**

**Lesson 2: What Does Science Tell Us
About Free Will & Determinism**

Unit 5: Are We Programmed or Do We Have Free Will? Discussions on Fate and Genetic Determinism

- Unit 5 Presentation Slide Deck (Scan QR code to view)
- Lecture Video (Seminar 1) (Scan QR code to view)

† **Lesson 1: Islamic View on Free Will & Determinism**

- Activity - Entry and Exit Ticket
- Assessment (Student's Edition & Teacher's Edition)

† **Lesson 2: What Does Science Tell Us About Free Will & Determinism**

- [Activity - What is Epigenetics? Video](#)
- [Activity - CRISPR Explained Video](#)
- Activity - Game of Life
- Supplemental Material - Developer of CRISPR
- Assessment (Student's Edition & Teacher's Edition)



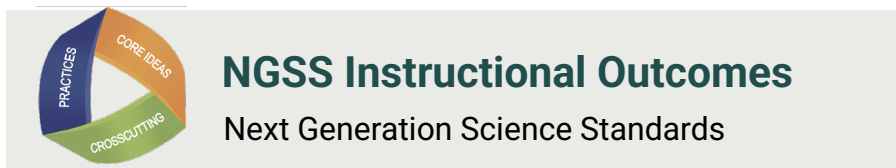
UNIT 5: ARE WE PROGRAMMED OR DO WE HAVE FREE WILL?

Discussions on Fate and Genetic Determinism

*Unit 5:
Lesson 1*

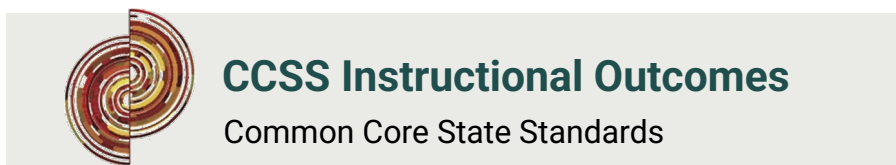
*Time
Length:
45–55 min*

Lesson 1 - Islamic View on Free Will & Determinism



Science and Engineering Practices

- † Asking Questions and Defining Problems: The lesson encourages students to ask questions about free will and determinism.
- † Engaging in Argument from Evidence: Discussing different theological and scientific perspectives involves evaluating evidence and forming arguments.



English Language Arts Standards - Reading: Informational Text

- † CCSS.ELA-LITERACY.RI.9-10.1 & RI.11-12.1: These standards involve citing strong and thorough textual evidence to support analysis, which is relevant to the activities involving the Qur'anic verses and theological perspectives.
- † English Language Arts Standards - Speaking and Listening
- † CCSS.ELA-LITERACY.SL.9-10.1 & SL.11-12.1: These involve engaging effectively in discussions, which is a key component of this lesson plan.

English Language Arts Standards - Writing

- † CCSS.ELA-LITERACY.W.9-10.1 & W.11-12.1: The lesson requires students to write arguments to support claims, which aligns with these standards.

- † Literacy in History/Social Studies, Science, & Technical Subjects
- † CCSS.ELA-LITERACY.RST.11-12.1: This involves citing specific textual evidence to support analysis of science and technical subjects, which can be applied in the context of discussing genetic determinism.

Content Learning Outcomes:

- † Describe the Islamic view on determinism and free will.
- † Explain the basic dimensions of human life.
- † Identify the meaning of Man's accountability (mukallaf).

Materials:

- † Presentation Slides (Slides 3-24)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Entry and Exit Tickets - 3"x5" index cards or online survey tool (Slido or Nearpod etc..)
- † Qur'an.com - Reference the Qur'anic Verse

Instruction/Teacher Facilitation:

- † Today we will engage in an age-old discourse of whether human beings are programmed or we have free will. Usually, this is a topic that brings about a lot of questions. So let us start with questions that you might have about the concept of qada and qadar.
- † Entry Tickets (View on page 232):
 - On the entry ticket (formal entry ticket, or an index card, or through an online survey tool), ask the students to respond to the question: "What do you think? Are we programmed or have free will? What are your thoughts and questions regarding do we have free will?"
 - If using index cards as the entry ticket, the teacher can collect them or allow students to keep them until the end of class so that the back can be used as the exit ticket. If using an online survey tool, close the survey or stop the acceptance of any more responses (re-open for exit ticket question).

SLIDE 3

- † These are some preliminary questions that I want you to think about and these will help guide our discussion today. (Ask the students if any of these are among the questions they have, or have written on their entry ticket.)

- What does 'free will' and 'determined' mean? To talk about these, we need to define them.
- Can we understand *Qada* and *Qadar*? Again, what do these terms mean, and how do we define them?
- Is it true that all of human life and human behavior is determined?
- What is the role of Prophethood in human behavior? - If everything is determined, and ordained, then what is the use or purpose of Prophets (because the purpose of Prophets is to guide people.)
- Do Muslim theologians hold the same opinion about human free will? - Is there one overarching definition of Qada and Qadar, or do they differ in their opinions?
- What is the scientific perspective on genetic determinism? (This will be covered in the next lesson.)

† In this discussion, the way we define these terms is essential. Whenever you want to discuss something, methodologically, always focus on the concept and the definition first (thasawwur). If you have a proper definition, this will help you analyze the topic more systematically and provide answers to your students' questions. So let us do exactly that and start with some definitions:

SLIDE 4

- Definitions of Free Will (according to different Muslim scholars):
 - ☒ The ability to freely and consciously make choices that are not externally determined. Freely i.e., not forced to do something; and consciously meaning that you are aware of, and understand, what you are doing.
 - ☒ The capacity of human beings to choose a course of action from among various alternatives/options/choices.
 - ☒ It also means voluntary choice or decision.

SLIDE 5

- Definition of determinism:
 - ☒ It implies that an act has been ordained in advance.
 - ☒ It is the belief that all events, including human actions, are ultimately determined by causes regarded as external to the will.
 - ☒ This implies that human beings have no free will and cannot be held morally responsible for their actions.

SLIDE 6

■ Let us look at these two concepts through some examples: Looking into human life, one observes that every person can freely:

- ▢ Drive a car
- ▢ Choose to eat this food or that food/drinks
- ▢ Choose his/her spouse
- ▢ Act with kindness towards others
- ▢ Help someone in need
- ▢ Work to achieve certain goals in life
- ▢ Improve certain conditions of life

SLIDE 7

■ But we also see that certain aspects of human life are pre-determined: In other words, we were not given any choice nor were we consulted on these matters

▢ Place of birth

- ▢ Race/Ethnicity
- ▢ Date of birth
- ▢ Sex/Gender
- ▢ The functions of body systems
- ▢ Respiratory system
- ▢ Immune system
- ▢ Cardiovascular system
- ▢ Urinary system

SLIDE 8

■ Wait a minute! (reflection). This is very interesting, because it means:

- ▢ There is an area of human life in which we can make choices, i.e., free will.
- ▢ AND, there are aspects of our lives that have been predetermined.

Now, let us put that into perspective... Let us see which areas of our human existence we have the ability to freely act and which areas we are determined.

SLIDE 9

† Human Nature - Human nature is the physiological and psychological characteristics shared by all humans.

■ There are three dimensions that form the human nature:

- ❑ Natural instincts
- ❑ Laws of the physical world (body)
- ❑ Optional choices

SLIDE 10

■ Laws of the physical world - in the picture, we see that the person and the apple are both being acted on by gravity.

- ❑ Our bodies, like everything else in the universe, are controlled by the laws of the physical world. In this case, we are referring to the physiological functioning.
- ❑ Examples: these laws govern our physical life
 - ❑ Laws of Motion
 - ❑ Gravitation force
 - ❑ Laws of reproduction
 - ❑ Functions of the human anatomy
 - ❑ Others

SLIDE 11

- ❑ Therefore, in this dimension:
 - ❑ Human life functions according to laws of nature e.g. we cannot fly on our own, no matter how much we will. Mankind is programmed and determined
 - ❑ Men and women have no free choice in these aspects.
 - ❑ Man is, therefore, not accountable for the events and incidents of this dimensions.
 - ❑ Textual evidence that the natural order of human life is already set:

■ (Activity: Instruct students to look up the following verses on their electronic devices, one by one, as the teacher mentions them; competition style to see who can find it first. Use Qur'an.com. The first student to find it can read the translation of the verse out loud to the class. This will be done for all the verse mentioned in the three following sections.)

- Surāh Al-Qamar 54: Verse 49 - **إِنَّا كُلَّ شَيْءٍ خَلَقْنَاهُ بِقَدَرٍ**
 "Indeed, We have created everything, perfectly

preordained.” - Everything is created following measures that Allah SWT has set/fixed.

- Surāh Al-Furqan 25: Verse 2 - “Allah is the One to Whom belongs the kingdom of the heavens and the earth, Who has never had any offspring, nor does He have a partner in governing the kingdom. He has created everything, ordaining it precisely.”
- فَقَدَرَهُ تَقْدِيرًا - Everything is well-measured, things happen in due time with perfect measurements.
- Surāh Ali-Imraan 3: Verse 6 -
- هُوَ الَّذِي يُصَوِّرُكُمْ فِي الْأَرْحَامِ كَيْفَ يَشَاءُ ۚ لَا إِلَهَ إِلَّا هُوَ الْعَزِيزُ الْحَكِيمُ
- “He is the One Who shapes you in the wombs of your mothers as He wills. There is no god worthy of worship except Him—the Almighty, All-Wise.”
- Surāh Ash-Shuraa 42: Verse 49 - “To Allah alone belongs the kingdom of the heavens and the earth. He creates whatever He wills. He blesses whoever He wills with daughters, and blesses whoever He wills with sons,”

- ☒ The conclusion here is that, this bodily, physical aspect of the human life has been pre-determined by God.

SLIDE 12

غ الحبلات أو الغرائز الطبيعية - Natural Instincts

- ☒ Inborn desires of the human psyche, or the ways of behaving: feelings that are not learned but inborn and common to all.
- ☒ Examples:
 - ☒ Reflection
 - ☒ Activity
 - ☒ Sexual Desires
 - ☒ Hunger
 - ☒ Ownership

SLIDE 13

- Innate instincts are inborn, not acquired, hence:

- ☒ The fulfillment of these innate instincts is acquired - we did not create these desires, but we were born with these desires/needs.

- ☒ Man is not accountable for having such instincts, i.e., these instincts are gifted. However the way in which we fulfill this instincts is something we will be accountable for.
 - ☐ Surāh Al-Araaf 7: Verse 31 - وَكُلُوا وَاشْرَبُوا وَلَا تُسْرِفُوا "O children of Adam,... eat and drink, but be not excessive..." - Allah SWT is telling us, when you feel hungry, eat and drink. This feeling is not in your control, it is instinctive, but how you react within your control. Allah SWT is not telling you do not feel hunger, He is saying when you fulfill that need, do it within in limit. Qur'an is guiding you to not overeat. Do not have wasteful behavior. And this is the choice you have.
 - ☒ Surāh Al-Israa 17: Verse 32 - "Do not go near adultery. It is truly a shameful deed and an evil way." - Human beings have a natural sexual desire instinct, Here again, Allah is not denying human sexual instinct, but He is guiding us to fulfill our desire in a right way by avoiding zina (and resorting to a lawful marriage). This is within our control.
 - ☒ Surāh Aal-Imraan 3: Verse 134 - "They are those who donate in prosperity and adversity, control their anger, and pardon others. And Allah loves the good-doers." Anger is a natural feeling and response when we face insult or mistreatment. Here Allah is not denying anger, but He is guiding us how to manage and control it. Whether we do that or not is within our choice and control.
- ☒ Through these verses, we see that Allah SWT guides us to manage those instincts, direct them, and fulfill them in the right way. Our decision and action with regards to those natural instincts are within our control; this is what we are held accountable for.

SLIDE 14

☒ Optional choices - الخيارات المكتسبة - These are elements that are completely within our choice.

- ☒ This means:
 - ☒ Left to one's choice; the ability to make a choice from given options.
 - ☒ It is the quest for the best of given options, with the will and ability to do the matter.
 - ☒ Accountable for making given choices - reward and punishment follow accordingly.

☒ For example to pray or not to pray, both options are there; to fast or not to fast; to work hard, who to marry etc... So we can decide, but we have to be ready to accept the consequences of our choices; accountability follows.

- Surāh Al-Insān 76: Verse 3 - **إِنَّا هَدَيْنَاهُ السَّبِيلَ إِمَّا شَاكِرًا وَإِمَّا كَفُورًا** "We already showed them the Way, whether they chose to be grateful or ungrateful." - no predisposition here, purely our choice of how we view things, we have the intellect to think about it, and whether we are grateful or not grateful is our choice.
- Surāh Al-Balad 90: Verse 10 - **وَهَدَيْنَاهُ النَّحْدَيْنِ** "And shown them the two ways of right and wrong" - both paths are open in front of every human being, and it is up to us to choose. (The previous verse in Surāh Al-Balad can also be discussed here further to advance this point.)
- Surāh Al-Muddaththir 74: Verse 38 - **كُلُّ نَفْسٍ بِمَا كَسَبَتْ رَهِينَةٌ** "Every soul, for what it has earned, will be retained." For every decision we make (freely and consciously), there are consequences.

☒ The ability to make choices and decisions that are tied to accountability makes humans (what is known in the Islamic tradition as 'Mukallaf')

SLIDE 15

† Mukallaf (morally accountable) - here we can see that humans are not responsible for some aspects of life (such as natural laws and natural instincts). But they are responsible for the choices they make while fulfilling those instincts. This freedom to choose and act comes with a responsibility and accountability; this constitutes the concept of 'Mukallaf.'

■ Not everyone is able to make choices on their own. As we know, children are not punishable for their deeds because they are not able to make consequential decisions. So the next question is: Who is a 'mukallaf'?

■ A mature and mentally sound person who can make a choice between given options:

- ☒ right or wrong
- ☒ good or bad

■ Accountable for the consequences of his/her actions:

- ☒ In Surāh Ash-Shams, we said that Allah SWT gave us a soul and proportioned our bodies, and here Allah SWT is saying

that after this, He "... inspired it [with discernment of] it is wickedness and it is righteousness," (Surāh Ash-Shams 91: Verse 8) This means that Allah gives us the ability to judge and differentiate between right and wrong. We are accountable for our decision and choice. If we select the right path, we will be guided. If we select the wrong path, we bear the burden of going astray.

SLIDE 16

- ☒ Man is accountable only for what he is capable of and able to do; physically and mentally.
- ☒ The presence of the faculty of the mind makes the person accountable for their choices.
- Options and actions are created by God, yet human beings have the ability to acquire (*kasb*). The opportunities presented in our life and the outcomes are all within Allah's power, but it is within our capacity to strive to yield the desires result.
- ☒ Surāh Al-Baqarah 2: Verse 286 - لَا يُكَلِّفُ اللَّهُ نَفْسًا إِلَّا وُسْعَهَا ط - لَهَا مَا كَسَبَتْ وَعَلَيْهَا مَا اكْتَسَبَتْ "Allah does not obligate anyone beyond his capacity. It will have [the consequence of] what [good] it has gained, and it will bear [the consequence of] what [evil] it has earned."
- The Messenger of Allah ﷺ said, "The pen is lifted from three people: a sleeping person until he awakens, a child until he becomes an adult, and an insāne person until he regains his sanity." (Sunan al-Tirmidhī 1423) - three types of people are NOT accountable for their deeds the insāne, the child, and the sleeping person.
- So for a Mukallaf to choose a way, the options have to be present and presented; this is where *hidayah* comes in.

SLIDE 17

- † What is the role of guidance (*hidayah*)?
 - ☒ Hidayah is advice or information provided to someone to do *right* or choose the best option.
 - ☒ Only in areas in which you have a choice because that is the area of accountability.
 - ☒ Prophethood and revelation are given to us, to aid the mind to choose the best of available options in life.

ع Surāh Al-Aaraaf 7: Verse 68 - وَأَنَا لَكُمْ نَاصِحٌ أَمِينٌ - "I convey to you the messages of my Lord, and I am to you a trustworthy adviser." (statement of Hud A)

■ And Surāh Al-Aaraaf 7: Verse 79 - "And he Salih [A] turned away from them and said, "O my people, I had certainly conveyed to you the message of my Lord and advised you, but you do not like the advisors."

SLIDE 18

† Two Methods of Divine Guidance: (Use the example of giving directions to someone.)

■ Guidance in the sense of showing the good way (hidayah al-dilālah) - generally guiding

☒ Surāh Fussilat 41: Verse 17 - "And as for the Thamūd tribe, We guided them, but they preferred blindness over guidance, so the thunderbolt of humiliating punishment seized them for what they used to earn." - The Thamūd was given guidance, but they chose not to take that guidance/chose to not follow it.

☒ When giving directions and guiding someone to some place, you can generally say, "Go north, not south."

■ Guidance in the sense of actual support to achieve the goals (hidayah al-tamkin) - actual assistance, practical application of the guidance given.

☒ Surāh Al-Qasas 28: Verse 56 - "Indeed, [O Muḥammad], you do not guide whom you like, but Allah guides whom He wills. And He is most knowing of the [rightly] guided."

☒ Surāh An-Nur 24: Verse 46 - "We have certainly sent down distinct/clear verses. And Allah guides whom He wills to a straight path."

☒ When giving directions, is like using the GPS to get someone to his destination, or taking the person physically there.

■ Allah SWT gives us both types of guidance. Allah SWT shows us the general direction (dilālah), and then also us in reaching that destination. The same goes to this life; Allah sends us His messengers and we can choose to follow or not to follow their guidance. If we do, we then seek Allah's help to assist us in reaching our destination.

■ When a person does not accept your directions, that means he/she is not interested in your assistance.

SLIDE 19

† This leads us to the concept of Qada and Qadar:

- Qada refers to the knowledge of God, whose knowledge covers the past, present, and future.
- The events and conditions of the entire universe are covered by His eternal knowledge before things and events take place.
- The divine measurement, or Qadar, reflects another level of divine destiny, which allows particular events and conditions to happen at a specific time and place.
- Qada means God's knowledge of all the events in life, while Qadar refers to bringing events according to His knowledge in their specific condition, time, and place.
 - ☒ The first level is Qada, Allah SWT possessing knowledge of everything and every time.
 - ☒ The second level is the actual occurrence of the event at its specific time and place.

SLIDE 20

† Four Pillars of the Divine Decree

1. God is All-knowing, and nothing falls beyond His knowledge.
2. God has written down part of His eternal knowledge (recorded), which covers everything.
3. God's will is all-encompassing; there is nothing that falls outside His will (*mashī'ah*- will). Nothing happens in this world without the will of Allah SWT .
4. Allah SWT is the True Creator, Who created everything and everyone.

SLIDE 21

- First, The Divine Knowledge: God is All-Knowing, and nothing falls beyond His knowledge.
 - ☒ Surāh Al-Ankabut 29: Verse 42 - "Surely, Allah knows whatever thing they invoke besides Allah, and He is the Mighty, the Wise."
 - ☒ Surāh Al-Hajj 22: Verse 70 - "Do you not know that Allah knows what is in the heaven and earth? Indeed, that is in a Record. Indeed that, for Allah, is easy."
 - ☒ Surāh Al-Jinn 72: Verse 28 - "so that He knows that they (angels) have conveyed the messages of their Lord."

And He has encompassed all that is with them, and has comprehensive knowledge of everything by numbers.”

- Second, The Divine Record: God has written down part of His eternal knowledge in a record, which covers everything, regardless of how big or small the thing or event might be.

- ☒ Surāh Al-Anaam 6: Verse 59 - “And with Him are the keys of the unseen; none knows them except Him. And He knows what is on the land and in the sea. Not a leaf falls but He knows it. And no grain is there within the darknesses of the earth and no moist or dry [thing] but that it is [written] in a clear record.”
- ☒ Surāh Al-Hadid 57: Verse 22 - “No calamity befalls the earth or your own selves, but it is (pre-destined) in a Book before We bring it into being, Indeed it is easy for Allah.”

SLIDE 22

- Third, The Divine Will: God’s Will is All-Encompassing; there is nothing that falls outside His Will. Whatever He wills, happens, and whatever He does not will, does not happen.

- ☒ Surāh Yaseen 36: Verse 82 - “His command is only when He intends a thing that He says to it, “Be,” and it is.”
- ☒ Surāh Al-Insān 76: Verse 30 - “And you do not will except that Allah wills. Indeed, Allah is ever Knowing and Wise.”

- Fourth, The Divine Creator: Allah SWT is the True Creator, Who created everything and everyone, including human actions and handiworks.

- ☒ Surāh Ghafir 40: Verse 62 - “That is Allah, your Lord, Creator of all things; there is no deity except Him, so how are you deluded?”
- ☒ Surāh Al-Furqan 25: Verse 2 - “The One to whom belongs the kingdom of the heavens and the earth, and who did neither have a son, nor is there any partner to Him in the kingdom, and who has created everything and designed it in a perfect measure.”
- ☒ Surāh Fatir 35: Verse 3 - “O mankind, remember the favor of Allah upon you. Is there any creator other than Allah who provides for you from the heaven and earth? There is no deity except Him, so how are you deluded?”

SLIDE 23

† Are we Free or Programmed? - Summary of Responses from Muslim schools of theology that have particular views on Qada and Qadar. There are 3 main schools of thought on this topic:

- Pro-deterministic school of theology - Jabriyyah - says that we do not have any free will, we are completely programmed.
- Pro-free will school of theology - *Mu'tazila* is (Rationalists) - says we create options for ourselves, and from those options/choices, we have free will to choose.
- The Sunni school of theology - Denies that human actions are completely pre-determined, or that humans have complete free will in all aspects of life. The Sunni school takes a middle path; some aspects of the human life are pre-determined, some aspects are subjected to free will.

SLIDE 24

† Summary:

- Humans have the ability to choose within the power of Allah.
- We are held accountable only in matters in which we have free choice. (If we do not have a choice in something, we are not held accountable for it.)

† Exit ticket: Using the formal exit ticket, or the other side of the index card "entry ticket," or the online survey tool, have the students answer the following questions:

- What questions from among the preliminary questions do you still have? Have they all been answered?
- What questions arise or do you still have about the concept of qada and qadar?

Unit 5: Lesson 1 - Assessment

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. Islam teaches that the reality of human nature is made of a combination of the physical body, a living organism, and a conscious soul that enables the person to have the capacities of free will, imagination, memory, reason, and emotion. TRUE FALSE
2. In Islam, human beings are not responsible for their inborn character nor are they accountable for their acquired behavior and actions. TRUE FALSE
3. In Islam, human beings are not devoid of choices but have free will to choose their path. TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

4. What does 'free will' in the Islamic context refer to?
 - a. The ability to act without any influence.
 - b. The ability to choose a course of action from various alternatives.
 - c. The belief that all actions are predetermined by a higher power.
 - d. The absence of any personal decision-making.
5. Determinism implies that:
 - a. Humans have complete control over their actions.
 - b. All events, including human actions, are predetermined by external causes.
 - c. Only some human actions are influenced by external factors.
 - d. External factors have no role in shaping human behavior.
6. Which of the following is an example of something predetermined in human life?
 - a. Choosing a spouse
 - b. Helping someone in need
 - c. Place of birth
 - d. Driving a car
7. What is the role of Prophethood in human behavior?
 - a. To enforce determinism
 - b. To provide guidance in making choices

- c. To remove the concept of free will
- d. To demonstrate the absence of human accountability

Section 3: Short Answer - Write a well-formulated response for each of the following.

- 8. Define 'Mukallaf' in the context of this lesson.

- 9. Explain the difference between Qada and Qadar as discussed in the lesson.

- 10. Discuss the three main schools of thought regarding free will and determinism in Islam. Explain what would be the problem of taking a completely determinist point of view or a completely free-will point of view.

Unit 5: Lesson 1 - Assessment (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

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2. In Islam, human beings are not responsible for their inborn character nor are they accountable for their acquired behavior and actions. TRUE > **FALSE**
3. In Islam, human beings are not devoid of choices but have free will to choose their path. > **TRUE** FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

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- a. To enforce determinism
- b. *To provide guidance in making choices •*
- c. To remove the concept of free will
- d. To demonstrate the absence of human accountability

Section 3: Short Answer - Write a well-formulated response for each of the following.

8. Define 'Mukallaf' in the context of this lesson.
 - † *A Mukallaf is a mature and mentally sound person according to Islamic theology who can make a choice between given options and is accountable for the consequences of his/her actions.*
9. Explain the difference between Qada and Qadar as discussed in the lesson.
 - † *Qada refers to the knowledge of God covering past, present, and future events and conditions. Qadar, on the other hand, is the divine measurement that allows particular events and conditions to happen at a specific time and place. Qada is about God's knowledge, while Qadar is about the actualization of events according to that knowledge.*
10. Discuss the three main schools of thought regarding free will and determinism in Islam. Explain what would be the problem of taking a completely determinist point of view or a completely free-will point of view.
 - † *Pro-deterministic School (Jabriyyah): Believes in complete determinism, asserting that humans have no free will and are entirely programmed. The problem here would be then why are we accountable for our deeds. They would not really be our chosen deeds, they were already decided for us.*
 - † *Pro-Free Will School (Mu'thazila/Rationalists): Argues that humans create options for themselves and have the free will to choose from those options. The problem here would be then where does Allah SWT 's control and will come into play.*
 - † *Sunni School of Theology: Takes a middle path, denying both complete determinism and complete free will. It declares that certain aspects of life are predetermined, while others involve free will.*

Name: _____
Date: _____

Entry Ticket

Do you think we are programmed or have free will? What are your thoughts and questions regarding Qada and Qadar?

Name: _____
Date: _____

Exit Ticket

What questions from among the preliminary questions do you still have? Have they all been answered?
What questions do you still have about the concept of qada and qadar?

Name: _____
Date: _____

Entry Ticket

Do you think we are programmed or have free will? What are your thoughts and questions regarding Qada and Qadar?

Name: _____
Date: _____

Exit Ticket

What questions from among the preliminary questions do you still have? Have they all been answered?
What questions do you still have about the concept of qada and qadar?

**UNIT 5: ARE WE PROGRAMMED
OR DO WE HAVE FREE WILL?**

Discussions on Fate and Genetic Determinism

**Lesson 2 - What Does Science Tell
Us About Free Will & Determinism****NGSS Instructional Outcomes**

Next Generation Science Standards

Science and Engineering Practices:

- † Asking Questions and Defining Problems: Students explore the scientific perspective on genetic determinism and its relation to free will.
- † Engaging in Argument from Evidence: Debating the extent to which genetics determine human behavior based on scientific evidence.

Crosscutting Concepts:

- † Cause and Effect: Understanding the relationship between genetic makeup and human behavior.
- † Systems and System Models: Analyzing the human body as a complex system affected by genetic and environmental factors.
- † LS3: Heredity: Inheritance and Variation of Traits: Exploring the role of genes in determining physical and behavioral traits.
- † LS4: Biological Evolution: Examining the concept of genetic determinism in the context of human evolution and behavior.



CCSS Instructional Outcomes

Common Core State Standards

English Language Arts Standards:

- † CCSS.ELA-LITERACY.RST.11-12.1: Citing specific textual evidence to support analysis of science and technical texts, focusing on how genes influence behavior.
- † CCSS.ELA-LITERACY.SL.11-12.1: Engaging in collaborative discussions on complex topics like genetic determinism and free will, building on others' ideas and expressing their own clearly.

Mathematics Standards:

- † Statistics & Probability: Understanding and interpreting statistical information related to genetics and behavior.

History/Social Studies Standards:

- † CCSS.ELA-LITERACY.RH.11-12.7: Integrating and evaluating multiple sources of information presented in diverse formats and media in order to address questions of free will and determinism.
- † CCSS.ELA-LITERACY.RH.11-12.9: Comparing and contrasting treatments of the same topic in several primary and secondary sources.

Content Learning Outcomes:

1. Describe gene interactions with human behavior
2. Describe the types of genetic determinism and their relations to human behavior

Materials:

- † Presentation Slides (25-46)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Video What is epigenetics? - Carlos Guerrero-Bosagna (Scan QR code to view)
- † Video CRISPR Explained (Scan QR code to view)
- † Supplemental Material - Article about the scientist who developed CRISPR Chinese scientist who produced genetically altered babies sentenced to 3 years in jail | Science (QR code on page 234)



- † Video The great free will debate | Bill Nye, Michio Kaku, Robert Sapolsky, Steven Pinker & more
- † Videos on individual scientists/scholars:
- † Robert Sapolsky - Why You Do not Have Free Will: Your Breakfast Food, Biology, and Culture | Robert Sapolsky
- † Bill Nye - Hey Bill Nye, Do You Believe In Free Will? | Big Think (page 244)
- † Michio Kaku - Michio Kaku: Why Physics Ends the Free Will Debate | Big Think
- † Game of Life Instructions (page 245)
- † Game of Life website - Conway's Game of Life (page 247)

Instruction/Teacher Facilitation:

- † In the last lesson, we learned about free will and determinism from an Islamic theological lens, but is there a way we can examine this concept through a scientific lens?
- † Ask students: How do you think science could/would approach the topic of free will and determinism? (Students might have a variety of answers.)
- † *Answer - Genetics, because genes determine a lot of what happens within our bodies, so is this a type of determinism?*
- † Let us explore this question: "What is the scientific perspective on genetic determinism?"

SLIDE 25

- † In discussing the topic of this lesson, "What Does Science Tell Us About Free Will And Determinism?" we will look at answering two essential questions:
 - Are we genetically determined?
 - Is the claim that we are genetically determined scientifically certain (*qatī*)?

SLIDE 26

- † Let us start by looking at what science can tell us about free will by examining the Libet Experiment
 - Conducted by Benjamin Libet (1983), this experiment aimed to explore whether our conscious decisions are made freely or determined by brain activity before we are aware of them.
 - Key Findings of the Libet Experiment:

- ☒ Brain activity (readiness potential) begins before a person consciously decides to act.
- ☒ Libet recorded EEG signals showing brain activity 300-500 milliseconds before the person reported making a conscious decision.
- ☒ This suggests that the brain 'decides' before the person is aware of making a choice.
- ☒ However, Libet also found a "veto power" - Even if the brain initiates an action, a person can still consciously stop it, implying some level of free will (but more like a "free won't").
- ☒ The Libet's data shows ambiguity in denying free will.

■ [These videos can be shared with students for a better understanding of the Libet Experiment]

☒ Resources:

1. [The Libet Experiment: Is Free Will Just an Illusion? – Scan the QR code to watch the video](#)
2. [Debunking Libet's Conclusions – Scan the QR code to watch the video](#)



SLIDE 27

† First, are we genetically determined?

■ We have to first define genetic determinism.

- ☒ At the individual level, it is the belief that our physical, human trait is that correspond to behavioral trait is determined by our genetic makeup.
- ☒ For example: the level of intelligence - IQ level it is determined on your genes.

SLIDE 28

† This requires us to go to a more basic level and examine what a gene is.

■ In biology or general science classes, we have seen genes before; they are the building blocks of life; the basic component of our DNA.

■ Example: like in a recipe book that gives instructions on how to make a dish on each page; similarly certain parts of your genes correspond to specific proteins, and those proteins then correspond to certain functions (like the nervous system etc..) and trait is (eye color, hair color, etc..).

- The question that arises is do we have genes that pinpoint to our behavioral trait is, like intelligence, temperament, etc..?

SLIDE 29

† Interesting Facts about Genes:

- Humans share around 96% of their DNA with chimpanzees, 90% with mice, and 60% with bananas! Depending on which location on the chromosomes we are looking at, 96% of our DNA is similar to chimpanzees. [This helps us see that we all, and all the things around us, come from a common Creator who uses similar things to create us.]
- Sequencing one person's genome generates around 200 GB of data, the capacity of a typical computer. If one were to write out the letters of the genome in a Microsoft Word document, of all 46 chromosomes, one would generate around 200 GB. One full page of writing contains an average of 12 kilobytes. That is a lot of information packed in just one cell, which has chromosomes all tightly wrapped storing this information.
- Distance wise, if all the DNA in your cells are laid out in a line, it would reach the sun and back around 70 times.
- If you speak one letter of DNA per second, 24 hours a day, it would take about 100 years to recite the entire human genome.
- Your genome is only around 0.1% different from any other person's, but that equates to 3 million differences in your DNA!

SLIDE 30

† Genetic Link To Behavior - Association Vs Causation

- Coming back to our question of whether or not we are genetically determined, we have to see how and what things are controlled by our genes.
- First of all, genes can be linked to effects/behaviors in many ways.
 - ☒ A causal relationship occurs when a change in one variable produces a change in the other variable.
 - ☒ Association or correlation between two variables, on the other hand, merely implies that knowing the value of one variable provides information about the value of another variable. For example, variable (A) seems to increase and as (A) increases, variable B also increases. This is an association; we see an effect happening which means that they might be related, BUT this does not mean that increase

in A is causing B to increase. The cause can be a 3rd factor or a combination of factors.

■ There is a spectrum of how genes correlate with trait is or behaviors:

- ☒ One - one gene is associated with one trait
 - ☒ For example: in cystic fibrosis or sickle cell anemia, if certain parts of a gene is altered, these diseases can develop.
- ☒ One ☒ Many - one gene is associated with many trait is
- ☒ Many - One - many genes are associated with one trait
- ☒ Many - Many - many genes are associated with many trait is
- ☒ Multifactorial - many genes interact with environmental factors

■ In terms of the strength of the association, there are different levels:

- ☒ Strong association: higher likelihood that changes in variable A (gene) is linked to changes in variable B (behavior)
- ☒ Moderate association: moderate likelihood that changes in variable A (gene) is linked to changes in variable B (behavior)
- ☒ Weak association: low likelihood that changes in variable A (gene) is linked to changes in variable B (behavior)

■ The correlation between genes and behavior is usually not straightforward or direct. There are often multiple mechanisms/ pathways involved that affect the outcome.

- ☒ As we might know from biology, the gene first needs to be transcribed and then translated into proteins. From these associated proteins, the behaviors can then be developed.
- ☒ The environment is another factor affecting the link between genes and behavior.
- ☒ Therefore, what causes a specific behavior or trait is multifactorial.

SLIDE 31

■ Let us look at this varied correlation and range of degrees of association with the example of OCD (Obsessive-compulsive disorder); we will see how this pathway of genes to behavior is complicated: [factors outlined in the diagram in the slide]

- ☒ There are genetic factors and environmental factors, and the transmission is done by the proteins resulting from

transcription and translation earlier, giving rise to the repetitive OCD thoughts and behaviors.

- ☒ Some studies suggest that OCD is due to genetics, but they so far found associations and not causation.
- ☒ From existing surveys and family genetic studies, no specific gene (or part of gene) has been identified as being responsible for OCD behaviors.
- ☒ The key takeaway here is that the relationships between genes and behaviors are complex and influenced by multiple factors.

SLIDE 32

† So far, we have been looking at how genes lead to human behavior. What about the other way around; can our behavior affect our genes?

- Scientific studies suggest that the things we do can, in fact, affect our genes.
 - ☒ Smoking, doing drugs, and alcohol consumption, for example, can alter our genes.
 - ☒ Extreme levels of stress (e.g. traumatic experiences of victims of Nazis) have been said to alter genes which were then passed on to the next generation.
 - ☒ Therefore, our actions or the lifestyle we adopt can affect our genes and their function.

SLIDE 33

- Current studies have indicated that:
 - ☒ Genes can influence your religiousness.
 - ☒ Gene screening can predict your political affiliation.
 - ☒ Genes can affect your education and economic status.

SLIDE 34

- Case Studies:
 - ☒ Murder Suspect - In 2017, there was a murder case, where a man attempted to kidnap a girl; a family member who tried to stop him was killed. The blood was found and sent to a lab. In this particular forensic lab, used the evidence (blood) to construct/identify the physical trait is. This picture is the result of their reconstruction. This suggested the brother of the boyfriend of that girl. Subsequently, the evidence was

screened again along with traditional DNA testing, and this man was found to be the actual perpetrator.

- ☒ This is what modern technology can do today. A minute amount of your DNA can be used to reconstruct physical trait is.
- ☒ This leads to the question: What are behavioral traits? There are many companies today that perform DNA testing and analysis for you. You send them a swab of your saliva, and within a few days, they can outline for you in detail, your ancestry and whether you have high/low levels of food cravings! This is the level that the study of genetics has achieved.

■ Bear in mind that all these tests and measurements are based on probabilities; there are elements of chance and uncertainty within all these associations.

SLIDE 35

† Epigenetics: These associations are part of a more complex pathway than just a gene being transcribed and translated. They are effects of what we call Epigenetics.

■ Here is an introduction to epigenetics and how it plays a role in affecting our behavior. Watch What is epigenetics? - Carlos Guerrero-Bosagna (scan QR code to watch video).

■ Epigenome - chemical tags that are attached to the genome that affect its expression.

- ☒ In the process of gene expression, transcription of genes is either boosted or interfered with.
- ☒ Methyl group - causing the DNA to be wrapped more tightly around the histone protein so that it becomes inaccessible, which then limits or inhibits gene expression.
- ☒ Other chemical groups will loosen the DNA wrapped around the histone protein, making it more accessible and therefore activating the gene expression or increasing gene expression.
- ☒ Epigenetic changes can survive cell division, which means they can continue to have effects on the person throughout their entire lives.
- ☒ The epigenome interacts between the genes and the environment, which include diet, chemical exposure, and medications.



- ☒ Example: although a pair of twins have the exact same DNA, their exposures and lifestyle choices can affect their epigenome, causing differences in their behaviors, the way they age, susceptibility to diseases, and lives in general. Social interactions also cause epigenetic changes that affect epigenetic trait is which were then passed on to their offspring.

† Epigenetics is not part of the DNA/gene sequencing it itself, it is beyond genetics.

- Studies show that epigenetics has a considerably strong influence on us and has become the focus of today's research.

SLIDE 36

† Now, coming back to the concept of genetic determinism: Classifying Genetic Determinism

- Full Determinism - only genetics plays a role in determining all your behaviors and actions.

- ☒ We have no choice whatsoever, everything is in our genes.
- ☒ Also known as Fatalism or Essentialism
- ☒ Example: Life is like puppetry, fully controlled by external factors and you have no control over your action.

- Partial Determinism - both genetics and the environment play a role

- ☒ This concept of nature versus nurture.
- ☒ Example: Twins - born genetically identical, but their environment and upbringing result in different abilities and behaviors.
- ☒ *Most scientists ascribe to this form of genetic determinism.
- ☒ A technological advancement made in the realm is genetics of CRISPR-Cas 9.

SLIDE 37

† How CRISPR works: Gene Editing (A cut and paste tool for genes.)

- CRISPR stands for Clustered Regularly Interspaced Short Palindromic Repeats

SLIDE 38

- Let us see how it works: Scan the QR code to watch CRISPR Explained



- Specific genes are located and targeted, then are replaced with a preferable gene in its place through the use of proteins.

■ 4 Basic Steps -

1. A protein called Cas-9 forms a complex with a guide RNA.
2. This complex attaches to a matching gene sequence
3. The Cas-9-RNA complex cuts the gene sequence.
4. The edited gene is inserted at this cut location.

- Chinese scientist, He Jiankui, genetically altered embryos using CRISPR and was jailed for it; the court considered his action unethical. (Scan QR code to read the article)

- Since we have the ability to edit our genes, scientists support the concept of being partially determined, because we have the choice to edit our genes. (If we were fully determined, then we would not have that option.)



SLIDE 39

† How does the concept of Mukallaf fit into genetic determinism?

- Anecdote 1: Mr (A) told the judge, "Your honor, my genes made me do the crime."

- ⊠ Ask students - How many of you agree with this statement?

SLIDE 40

- ⊠ Let us look at the evidence: Genes and criminal behavior
 - ⊠ So scientists looked at the reason for the aggression in people and noticed that they had high levels of serotonin (a neurotransmitter).
 - ⊠ Looking at their genetic screening results suggests that they have an altered monoamine oxidase enzyme.
 - The function of monoamine oxidase enzyme is to turn off the mechanism that makes/releases serotonin in the body. Since this enzyme is altered, serotonin production is not capped, resulting in higher levels of serotonin in the body. Higher levels of serotonin leads to higher levels of aggressiveness.
 - Mechanism => an altered monoamine oxidase enzyme -> high serotonin (a neurotransmitter) > aggression
 - ⊠ Many scientists/researchers do not agree with this association. They said that those with aggression might have high levels of serotonin, but not the other way around, that everyone with high levels of serotonin will act aggressively.

- ☒ Example: You have a knife. Just because you have a knife does not mean you are a criminal. It depends on what you do with the knife. Criminals who kill may have knives with them, but your having a knife does not mean you will murder someone with it.
- ☒ So the evidence for high levels of serotonin leading to aggression is weak. This would be classified as an association, but not causation.
- ☒ Ask Students: Based on the evidence, is this association/correlation *qatī* or *zannī*? [*zannī*]

SLIDE 41

- Anecdote 2: During a public debate, Mr. K argues: "Same-sex attraction is predisposed in my genes."

SLIDE 42

- ☒ A study was done among half a million people by the UK Biobank and concluded that there is no single "gay" gene, so there is no specific gene.
- ☒ They found some associations, about 8-25%, but they were not able to pinpoint to a specific gene or locations of some genes that caused this behavior.
- ☒ There can be some inclination in a person, in their heart/mind, but there is no consequence for that. The consequences are based on actions; acting upon that inclination results in sin.
- ☒ Ask Students: Based on the evidence here, is this association/correlation *qatī* or *zannī*? [*zannī*]

SLIDE 43

- Scan the QR code to watch the video:
- ☒ Robert Saploski - Harvard scholar - Determinist, says that free will is a myth; we are biological creatures, and all of our "choices" actually depend on biological forces.
- ☒ Bill Nye - the Science Guy - Confused about the topic, says a little bit of both; determinism results from our condition but some levels of choice exist.
- ☒ Michio Kaku - Physicist - says there is uncertainty with regards to the position of electrons. In terms of free will, he feels that we do have some kind of free will.



SLIDE 44

■ Summary of the scientific view on genetic determinism, based on these 3 scholars:

- ❑ We can categorize genetic determinism into full determinism & partial determinism.
- ❑ The interactions between genes & behavior are complex and multifactorial, and we also have the ability to edit genes. (Genetics and Epigenetics)
- ❑ With regard to crime and same-sex attraction, the evidence of genetic determinism is not conclusive and is uncertain.
- ❑ Scientists differ on whether our actions are deterministic, or we have free will due to the elements of uncertainty in the laws of nature (i.e., we do not know everything).

† The scientific and Islamic perspectives on determinism and free will are closely related in some regard.

- Both state that we do have some free will while some elements might be pre-determined. Therefore, both determinism and free will happen/exist.
- The Islamic theological aspect of determinism and free will is qati, whereas the scientific aspects are *zanni* and no definitive answer can be concluded.

SLIDE 45

SLIDE 46

† **Culminating Group Activity: The Game of Life** (see *worksheet on page 247*)

- Divide the students into groups. Each group gets 20 square stickers and a sheet of grid poster paper.
- Place these 20 square stickers strategically on the grid paper following the given rules.
- Transport the positions of these stickers to the corresponding grid on Play Game of Life (scan the QR code to play the game).
- When all the groups are done putting in their positions on the website, then press START to see how many squares are alive.
- Document the number of live squares for each group.



SLIDE 47

† Learning points from this activity: Discussion about the game and its relation to reality.

- Scan the QR code to watch the video:
- Significant points to discuss

- ☒ This game represents the topic of determinism and free will.
- ☒ What do we have a choice in? - where we placed the squares on the grid originally
- ☒ What aspect is determined? - the number of squares given originally (20), there is a set of rules
- ☒ In life, some aspects are determined and in some aspects, we have free will.
- ☒ The life continues whether we understand the rules or not.
- ☒ In the end, we are at the Mercy of Allah SWT .

Biology Connections:

This lesson pairs very closely with sections on genetics in biology courses. (In most Biology textbooks, this would be Unit 2 on Genetics. There are specific chapters on how genes are controlled and DNA technology intersects with Genomics.)

→ Genes and Alleles, genotypic and phenotypic trait is, etc...

→ Gene function, gene expression (Transcription and Translation of DNA), and gene editing → activation and inhibition of genes

→ Proteomics and Epigenetics

† Nature vs Nurture

Game of Life Explanation: Conway's Game of Life

The Game of Life is not your typical computer game. It is a cellular automaton and was invented by Cambridge mathematician John Conway. This game became widely known when it was mentioned in an article published by Scientific American in 1970. It consists of a grid of cells that, based on a few mathematical rules, can live, die, or multiply. Depending on the initial conditions, the cells form various patterns throughout the game.

Instructions:

1. Each group has 20 squares to begin with.
2. Place them strategically on the grid paper.
3. Transport those positions to the website grid.
4. Then press START to see how many alive squares you end up with.
5. Document the number of squares you have at the end.

Rules

For a space that is populated:

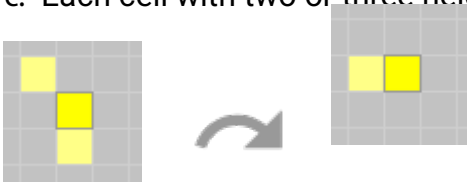
- a. Each cell with one or no neighbors dies, as if by solitude.



- b. Each cell with four or more neighbors dies, as if by overpopulation.



- c. Each cell with two or three neighbors survives.



- † For a space that is empty or unpopulated:
Each cell with three neighbors becomes populated.



For more information, scan the QR code and watch the video about the Game of Life:



Unit 5: Lesson 2 - Assessment

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. The interaction between genes and human behavior involves the role of epigenetics. TRUE FALSE
2. The scientific evidence of genetic determinism is certain and without doubt. TRUE FALSE
3. Human DNA and chimpanzee DNA are approximately 98% similar. TRUE FALSE
4. The concept of full genetic determinism supports the idea that genes alone control all aspects of human life. TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

5. Genetic determinism implies that:
 - a. Environment plays a major role in shaping human behavior.
 - b. Human behavior is primarily determined by genetic makeup.
 - c. Human genes have no impact on behavior.
 - d. All human trait is are solely determined by lifestyle choices.
6. Epigenetics is the study of:
 - a. Changes in organisms caused by modification of gene expression.
 - b. The evolutionary history of genes.
 - c. Genetic mutations and their effects on organisms.
 - d. The role of genes in the development of diseases.
7. What does the similarity in DNA across different species (e.g., humans and chimpanzees) suggest in the context of genetic determinism?
 - a. Different species have identical behavioral trait is.
 - b. DNA similarity has no impact on physical or behavioral trait is.
 - c. It highlights common origins and genetic makeup.
 - d. Behavior in humans is entirely determined by the environment.

8. In the context of genetic determinism, what role does epigenetics play?
 - a. It negates all genetic influences on behavior.
 - b. It determines the physical appearance exclusively.
 - c. It modifies gene expression without altering the DNA sequence.
 - d. It has no impact on gene expression or behavior.
9. The concept of 'partial determinism' in genetics implies that:
 - a. Only a part of the human genome is effective in determining trait is.
 - b. Human traits and behaviors are influenced by both genetics and environment.
 - c. Genetic factors are less significant than environmental factors.
 - d. Human behavior can be predicted with complete accuracy based on genes.
10. CRISPR technology is significant in the study of genetic determinism because it:
 - a. Proves that behavior is not influenced by genes.
 - b. Allows for the editing of genes, which can alter trait is and behaviors.
 - c. Demonstrates that environmental factors are irrelevant.
 - d. Confirms that all human trait is are predetermined at birth.
11. Which of the following best describes the relationship between genes and behavior according to current scientific understanding?
 - a. Genes have no influence on human behavior.
 - b. Behavior is determined solely by environmental factors.
 - c. Genes and behavior have a complex, multifactorial relationship.
 - d. All human behaviors can be traced back to specific genes.
12. The concept of full genetic determinism is analogous to:
 - a. A choose-your-own-adventure book.
 - b. A puppet being controlled by a puppeteer.

- c. A collaborative team project.
- d. An open-ended game with no rules.

Section 3: Short Answer - Write a well-formulated response for each of the following.

- 13. Explain the difference between causal relationships and associations in the context of genes and behavior.
- 14. Describe how environmental factors interact with genetic determinism.
- 15. Discuss the case of the Chinese scientist who used CRISPR technology to genetically alter embryos. Analyze the ethical implications and the relationship between gene editing and genetic determinism.

Unit 5: Lesson 2 - Assessment (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. The interaction between genes and human behavior involves the role of epigenetics. > TRUE FALSE
2. The scientific evidence of genetic determinism is certain and without doubt. TRUE > FALSE
3. Human DNA and chimpanzee DNA are approximately 98% similar. > TRUE FALSE
4. The concept of full genetic determinism supports the idea that genes alone control all aspects of human life. > TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

5. Genetic determinism implies that:
 - a. Environment plays a major role in shaping human behavior.
 - b. *Human behavior is primarily determined by genetic makeup.* •
 - c. Human genes have no impact on behavior.
 - d. All human trait is are solely determined by lifestyle choices.
6. Epigenetics is the study of:
 - a. *Changes in organisms caused by modification of gene expression.* •
 - b. The evolutionary history of genes.
 - c. Genetic mutations and their effects on organisms.
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 - a. A choose-your-own-adventure book.
 - b. *A puppet being controlled by a puppeteer. •*
 - c. A collaborative team project.
 - d. An open-ended game with no rules.

Section 3: Short Answer - Write a well-formulated response for each of the following.

13. Explain the difference between causal relationships and associations in the context of genes and behavior.

Causal relationships in genetics imply that a change in a specific gene directly results in a change in behavior or trait. Associations indicate a correlation where two variables are linked, but one does not necessarily cause the other. For example, a gene might be associated with a behavior, but it does not directly cause that behavior.

14. Describe how environmental factors interact with genetic determinism.

Environmental factors can influence genetic determinism by affecting gene expression. Factors such as diet, stress, and exposure to chemicals can modify the epigenome, which in turn can activate or deactivate certain genes. This interaction shows that while genes play a crucial role in determining trait is and behaviors, environmental conditions also have a significant impact.

15. Discuss the case of the Chinese scientist who used CRISPR technology to genetically alter embryos. Analyze the ethical implications and the relationship between gene editing and genetic determinism.

The case of the Chinese scientist using CRISPR for gene editing in embryos raises ethical concerns about gene manipulation, consent, and the potential consequences of altering the human genome.

This case highlights the complexities of genetic determinism and the ethical boundaries of gene editing. It also opens up discussions about the potential benefit is and risks of such technologies in influencing human genetics and the concept of free will.

UNIT 5:FATE AND GENETIC DETERMINISM

Resource Materials

These are resources that apply to this lesson and would be beneficial for teachers (or students):

- † Can be used as follow-up material
- † Can be used to supplement as information is taught
- † Can be used as background information for teachers, to equip and/or prepare the teacher for content that is being taught

Islamic Perspective (scan the QR code to view the video):

- † [Destiny and Predestination in Islam](#) - Mawlana Saaleh Baseer of Darul Qasim



Philosophical View (scan the QR codes to view the videos):

Crash Course Philosophy, 2 part explanation:

1. [Determinism vs Free Will: Crash Course Philosophy #24](#)
2. [Compatibilism: Crash Course Philosophy #25](#)



Scientific View (scan the QR codes to view the videos):

- † [Big Think: The great free will debate | Bill Nye, Michio Kaku, Robert Sapolsky, Steven Pinker & more](#)
 1. Robert Sapolski - Harvard scholar - Determinist, says that free will is a myth; we are biological creatures, and all of our "choices" actually depend on our biological forces. • [Why You Do not Have Free Will: Your Breakfast Food, Biology, and Culture](#) | Robert Sapolsky
 2. Bill Nye - the Science Guy - Confused about the topic, says a little bit if both determinism due to conditions but still have a level of choice. • [Hey Bill Nye, Do You Believe In Free Will?](#) | Big Think
 3. Michio Kaku - Physicist - says there is uncertainty in regards to the position of electrons. In terms of free will, he feels that we do have some kind of free will. • [Michio Kaku: Why Physics Ends the Free Will Debate](#) | Big Think



Neuroscientific and Free will Resources:

- † [Free Will and Neuroscientific: From Explaining Freedom Away to New Ways of Operationalizing and Measuring It - PMC](#)

UNIT 5: FREE WILL AND DETERMINISM

Question Bank

A bank of questions students have asked or might ask on this topic accompanied by appropriate and sample answers.

1. Q: If a person commit is suicide, why is he or she blamed or subject to punishment when Allah SWT allows it to happen?

- a. **A: We acknowledge committing suicide is a major sin and, in the hereafter, s/he will be punished.**

عَنْ أَبِي هُرَيْرَةَ قَالَ قَالَ رَسُولُ اللَّهِ صَلَّى اللَّهُ عَلَيْهِ وَسَلَّمَ مَنْ قَتَلَ نَفْسَهُ بِحَدِيدَةٍ فَحَدِيدَتُهُ فِي يَدِهِ يَتَوَجَّأُ بِهَا فِي بَطْنِهِ فِي نَارِ جَهَنَّمَ خَالِدًا مُخَلَّدًا فِيهَا أَبَدًا وَمَنْ شَرَبَ سَمًّا فَقَتَلَ نَفْسَهُ فَهُوَ يَتَحَسَّاهُ فِي نَارِ جَهَنَّمَ خَالِدًا مُخَلَّدًا فِيهَا أَبَدًا وَمَنْ تَرَدَّى مِنْ جَبَلٍ فَقَتَلَ نَفْسَهُ فَهُوَ يَتَرَدَّى فِي نَارِ جَهَنَّمَ خَالِدًا مُخَلَّدًا فِيهَا أَبَدًا

Abu Huraira reported: The Messenger of Allah, peace and blessings be upon him, said, "Whoever kills himself with a piece of iron, his piece of iron in his hand will be thrust into his stomach in the fire of Hell forever and ever. Whoever drinks poison and kills himself, he will consume it in the fire of Hell forever and ever. Whoever throws himself off a mountain and kills himself, he will tumble into the fire of Hell forever and ever."

- b. Indeed, everything that happens to us is with the will of Allah SWT . It demonstrates the omnipotence of Allah.
وَمَا تَشَاءُونَ إِلَّا أَنْ يَشَاءَ اللَّهُ إِنَّ اللَّهَ كَانَ عَلِيمًا حَكِيمًا ٣٠
And you do not will except that Allah wills. Indeed, Allah is ever Knowing and Wise. (76:30)
- c. If suicide can occur without the power of Allah, then it suggests that Allah is not all-powerful. Nevertheless, it is not the reality as we see that not all suicide attempts are successful.
- d. If all suicides occurs with 100% success, then we might say humans have no free will to control the action.
- e. Therefore, within Allah's wisdom, some suicides happen, to demonstrate human free will, and others fail, to demonstrate the power of Allah's interference.
- f. The blame on human beings is due to the choice of disobedience to Allah SWT . As mentioned in Surāh al-Kahf, فَمَنْ شَاءَ فَلْيُؤْمِنْ وَمَنْ شَاءَ فَلْيُكْفُرْ And say, "The truth is from your Lord, so whoever wills - let him believe; and whoever wills - let him disbelieve." (18:29)
- g. Nevertheless, only Allah SWT knows the final judgment of a person. As mentioned in a hadīth, Allah SWT forgives Al-

Tufayl ibn 'Amr though he seemed to have committed suicide by cutting his fingers. He was forgiven because he emigrated with the Prophet ﷺ.

Jabir reported: When the Prophet, peace and blessings be upon him, emigrated to Medina, Al-Tufayl ibn 'Amr also emigrated along with a man from his people. They strongly disliked the climate of Medina, and the man became sick and suffered from anxiety. He took some of his arrowheads, cut the joints of his fingers, and his hands bled out until he died. Al-Tufayl saw him in a dream looking as if he were well, but his hands were covered. Al-Tufayl said, "How has your Lord treated you?" The man said, "He has forgiven me due to my emigration to His Prophet." Al-Tufayl said, "Why do I see your hands covered?" The man said, "I was told that 'we would not repair what you yourself have ruined.'" Al-Tufayl told the story to the Messenger of Allah, peace and blessings be upon him, and he said, "O Allah, forgive his hands as well." (Sahih Muslim)

UNIT 06:

Are Human Beings Unique in this Universe?

**Scientific and
Theological Inquiry about
Extraterrestrial Life**

Lessons

Lesson 1: Do Extra-terrestrial Beings Exist

**Lesson 2: Human Exceptionalism and
How Certain Is Extra-terrestrial Life**

Unit 6: Are Human Beings Unique in this Universe? Science and Theological Inquiry about Extraterrestrial Life

- Unit 6 Presentation Slide Deck (Scan QR code to view)
- Lecture Video (Seminar 5) (Scan QR code to view)

† Lesson 1: Do Extraterrestrial Beings Exist

- Supplemental Material - How Hadīth Criticism Works
- Assessment - (Student's Edition & Teacher's Edition)

† Lesson 2: Human Exceptionalism and How Certain Is Extra-terrestrial Life

- Supplemental Material - Comprehending "Human Exceptionalism"
- Assessment (Student's Edition & Teacher's Edition)



UNIT 6: ARE HUMAN BEINGS UNIQUE IN THIS UNIVERSE?

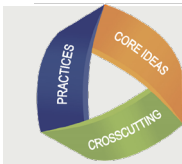
Science and Theological Inquiry about Extraterrestrial Intelligent Life

Unit: 6

Lesson: 1

Time
Length:
45–50 min

Lesson 1 - Do Extraterrestrial Beings Exist?



NGSS Instructional Outcomes

Next Generation Science Standards

- † HS-ESS1 Earth's Place in the Universe: This standard involves understanding the universe and its stars, and the Earth and the solar system within it. The lesson's focus on extraterrestrial life aligns well with the broader themes of astrobiology and the nature of the universe.
- † HS-LS2 Ecosystems: Interactions, Energy, and Dynamics: While this standard primarily focuses on Earth's ecosystems, the exploration of extraterrestrial life can be a gateway to discussing these concepts in a broader, universal context.
- † HS-LS4 Biological Evolution: Unity and Diversity: The discussion about evolution in relation to extraterrestrial life could fit here, especially in terms of understanding the diversity of life forms that could exist in the universe.
- † Science and Engineering Practices: These practices, such as asking questions and defining problems; analyzing and interpreting data; engaging in argument from evidence; and obtaining, evaluating, and communicating information, are integral to the lesson's structure, especially in its focus on scientific inquiry and theological perspectives.



CCSS Instructional Outcomes

Common Core State Standards

- † CCSS.ELA-Literacy.RST.11-12.1: This standard involves citing specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account. The lesson's focus on examining scientific and theological texts fit is well here.
- † CCSS.ELA-Literacy.RST.11-12.2: This standard is about determining the central ideas or conclusions of a text; summarizing complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms. The lesson's emphasis on students discussing and presenting summaries of their findings aligns with this standard.
- † CCSS.ELA-Literacy.RST.11-12.7: This involves integrating and evaluating multiple sources of information presented in diverse formats and media in order to address a question or solve a problem. The use of videos, presentation slides, and discussions in your lesson plan aligns well with this standard.
- † CCSS.ELA-Literacy.RST.11-12.8: This standard focuses on evaluating the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible, and corroborating or challenging conclusions with other sources of information. The lesson's structure, which encourages critical thinking and evaluation of scientific and theological ideas, fits this standard.

Content Learning Outcomes:

- † Describe & explore the underlying motivations to pursue specific fields of inquiry.
- † Describe & explain the underlying motivation for Muslims to pursue intellectual questions.
- † Evaluate how applying Islamic epistemology information questions.
- † Explain & evaluate the potential theological implications of scientific questions

Materials:

- † [Presentation Slides](#) (Slides 6-31)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † [Video: Is There Life On Other Planets? | Universe | Earth Lab](#)
- † [How Hadīth Criticism Works](#) - Supplemental Material

Instruction/Teacher Facilitation:

- † The Big question that we will be addressing today is “Are humans unique in the universe?”
 - We discussed in our evolution discussion that humans are unique in this world/earth, and set apart from other creations and creatures, but are we unique in the universe?
- † Let us zoom out a little bit first and see where this question is coming from, to begin with. Ask Students: What is the motivation for us, as scientists, or as students, or as scholars, or even as Muslims, to pursue a specific field of inquiry or discovery?
 - Why do scientists ask the questions that they ask?
 - How would our questions as Muslim scientists be different?
 - How or why do we allocate resources more to one inquiry path than another?
 - ☒ If some scientists, or the companies they work for, are motivated primarily by money, we would frown upon that because money is not the best motivator for a beneficial or positive outcome.
- † Ask Students: What is our motivation in determining whether or not extraterrestrial beings exist?
 - Why did scientists ask this question/what is important to them?
 - What would be the motivation for Muslim scientists to see whether or not extraterrestrial beings exist? Why would they ask this question or want to look into this subject?
 - How would the motivation of a general scientist be different from a Muslim scientist? How would these motivations differ from that of a theologian?
 - ☒ Looking at this from the theological perspective and not a solely scientific endeavor, would our Islamic knowledge/theology generate specific questions or change the way they look at things?
- † As Muslims, our intentions matter, so we should always think about what is our intention for pursuing a certain type of inquiry.

SLIDE 6

† For us to understand what we will be discussing, let us make sure we are all on the same page by defining some terms:

- Extraterrestrial life is defined as life that may exist or may have existed in the universe outside of Earth.
- Extraterrestrial intelligence is defined as hypothetical extraterrestrial life that is capable of thinking and conducting purposeful activity. (Also, a being that might be *mukallaf* - accountable for actions.)
- Astrobiology, also called exobiology or xenobiology, is a multidisciplinary field dealing with the nature, existence, and search for extraterrestrial life (life beyond Earth).
 - ☒ Astrobiology encompasses areas of biology, astronomy, and geology.

† Certain vs. Probabilistic Knowledge

SLIDE 6

† Ask Students: How many of you have ever asked the following question: Does extraterrestrial intelligent life exist? (Have students raise hands for affirmative.)

- What answer have you come up with? (Students respond, yes, no, maybe, etc..)
- Why do you think so? What evidence can you provide?

SLIDE 7

- Scan QR code to watch: Is There Life on Other Planets? | Universe | Earth Lab

SLIDE 8

- ☒ Discuss in groups your reaction to this video and answer the following questions. Then present your discussion summary to the whole class.
 - ☒ Does extraterrestrial intelligent life exist?
 - ☒ What changed your opinion? (If you changed your mind)
 - ☒ What is the level of certainty?
 - ☒ What evidence in the video caught your attention?



SLIDE 9

- † Scientific endeavors and statistical analyses are usually and fundamentally based on certain assumptions. What is the level of chance/probability that this is true or false, or what is the chance that something might or might not happen? Chance is a standard in scientific inquiry.
 - Theological certainty will change our understanding of how much “chance” plays a role in a question.
 - Concept of Evolution - There are various notions of evolution. Biological evolution is where you have changes like from one species into another species, or from a non-intelligent being to an intelligent being.
 - There is also an evolution of truth, i.e., over time, do we get closer to or further away from the truth? Technological innovations get better than the past versions. Scientific innovation is supposed to work similarly, where research should lead us to a better understanding of things.

SLIDE 10

- † There is also evolution in morals and ethics, of what is considered good and bad. Today, much of that evolution in science also evolves the moral beliefs people hold. What is “good” in the mainstream now could be very different than what was “good” 100 years ago, or will be 100 years from now.
 - Scientific advancements are more physical and empirical-based
 - ⊠ Society and cause/effect witnessed empirically in this world determine what is moral or ethical.
 - ⊠ The concept of the “latest” meaning “better” is a social construct that has been readily adopted.
 - As Muslims, we can examine if truth evolves, and what parts of truth evolve:
 - ⊠ What is moral or ethical is determined primarily by revelational content.
 - ⊠ What parts of life or society can evolve would be determined by its implications that are “*akhirah*-bound”, i.e., what effect/consequences would be incurred in the hereafter.
 - A Muslim’s solution to any situation or problem would be universally beneficial; it would be beneficial in this world (*dunya*) as well as in the hereafter (*akhirah*).

- ☒ This worldly benefit would extend to not only Muslims but to non-Muslims as well.
- ☒ E.g., removal of alcohol from society - benefit is Muslims (a *haram* is eliminated) therefore benefitting the Muslims in this world as well as the hereafter (because they are able to effectively stay away from a prohibited element which would have been an avenue of sin/punishment). Similarly, this removal of alcohol from society also benefit is non-Muslims, because they too would be distanced from its harmful effects in this world.

SLIDE 11

† Probable Understandings

- Without a lot of information (just a 3-minute video), many of you came to a conclusion about extraterrestrial life and extraterrestrial intelligence. But most of your answers were “I think,” “there is a chance,” “it is possible,” “the probability is low/high.”
- The physicist who is speaking in the video thinks it is highly possible but if you were to ask a biologist the same question, s/he might say that it is highly unlikely that ETI exists because so many factors play a part in the process of evolution for the existence of life. Therefore, we are still left in the realm of probability.
- *zannī* is probabilistic knowledge
- *Qatī* is certain knowledge
- But both are still types of knowledge

† Knowledge Types:

- Latin for knowledge = “*sciencia*” i.e., science; so anyone who is engaged in the study of knowledge, from the Islamic epistemology, is considered a scientist.
- There is a lot of knowledge and different knowledge types that need to be determined if something is a certainty or probability.
- We have already looked at Empirical, Rational, and Revelatory Knowledge in Unit 1.

SLIDE 12

† Case Study: The Seven Earths Question

- We have looked at the question of ETI from the perspective of physics, statistics, and astrobiology. What about from the perspective of revelation?

- ❑ What type of evidence is the physicist using in the video? - Rational evidence and Empirical evidence, but no Revelatory evidence.
- ❑ In Islamic history, the question of ETI actually came up very early on with the study of the concept of the seven earths.

SLIDE 13-14

- Epistemological Framework: Is there proof of other “earth” with intelligent life? If so, what is the nature of these proofs? - Note that “terrestrial” means earthly terrain or earth.
- ❑ Empirical (*‘Adī*) Evidence - says that it is possible (not a certainty)
- ❑ Rational (*‘Aqlī*) Evidence - says that it is possible
- ❑ Revelatory (*Shar’ī*) Evidence - We have not explored this yet, so let us see what revelation says.

SLIDE 15

- Revelation Exploration - Muslim scholars, and scholars of hadith in particular, do what other scientists do, which is comb through a great deal of knowledge.
- ❑ Looking through revelatory evidence is like looking at the stars:
 - ❑ On a clear night, you look at the stars. When you look at the stars closely and try to focus on just a set of stars, you see more stars in between those stars. The further you look and the longer you look, the more stars you see.
 - ❑ The same experience and assumption have been true when looking at the Qur’an. The source of revelation is Allah SWT, a pre-eternal, unlimited, never-ending being that is the source of all existence. Therefore, the word of Allah SWT is also unlimited in its scope. Looking into revelatory evidence in the same way you look at the stars, you will see an immense amount of vastness in those pieces of evidence. The longer and further in the Qur’an you look, the more meanings we can extract.

SLIDE 16

- Searching in the Qur’an, we find this verse:
 - ❑ اللَّهُ الَّذِي خَلَقَ سَبْعَ سَمُوتٍ وَوَمِنَ الْأَرْضِ مِثْلَهُنَّ ۚ يَنْزِلُ الْأَمْرُ بَيْنَهُنَّ لِتَعْلَمُوا أَنَّ اللَّهَ عَلَىٰ كُلِّ شَيْءٍ قَدِيرٌ ۚ وَأَنَّ اللَّهَ قَدْ أَحَاطَ بِكُلِّ شَيْءٍ عِلْمًا It is Allah who

created the seven heavens and of the earth their like, the command descending down through all of them, so that you may know that Allah has power over all things and that Allah encompasses all things in knowledge. (Surāh At-Talaaq 65: Verse 12)

- ☒ In this Verse, what does **مِثْلَهُنَّ** mean? Literally means “similar to it”
- ☒ Ask Students: What is the implication of this meaning? Similar to what and how?
 - ☒ 7 earths
 - ☒ Similar to whatever is on the earth

SLIDE 17

■ Interpretations of the Qur'anic Verse - Out of all the possible interpretations, these are 2 main interpretations:

1. Likeness in complexity: Just like the heavens are complex, similarly the earth is complex. They are composed of various components: earth, air, water, fire, etc...
2. Likeness in number: Dominant opinion. Seven earths like seven skies/heavens.
 - ☒ Layered, connected, no separation between the earths.
 - ☒ Layered, disconnected, separated by the distance of what lies between the earth and sky. Each earth contains different creatures of Allah SWT.

This latter interpretation is preferred due to corroboration from hadīth reports, e.g.: “O Allah, Lord of the seven skies and what they shelter, Lord of the seven earths and what they carry...” (al-Bukhārī). [The plural of earth, and 7 is explicitly mentioned in this Hadīth.]

- ☒ This Hadīth is also suggesting that there are other earths. So now that we established that other earths exist, we can consider if extraterrestrial life exists, and then look at ETI.

SLIDE 18

■ Searching the hadīth for ETI

- ☒ When Ibn Abbās (R) was asked about this very verse in Surāh Talaq, this is what he commented on the verse (Q 65:12): “In each earth, there is the like of Ibrāhīm”.

- ☒ In another version of the report, Ibn Abbās (R) said: “Seven earths, in each earth there is a prophet like your prophet, an Ādam like your Ādam, a Nūh like your Nūh, an Ibrāhīm like your Ibrāhīm, and an Īsā like your Īsā.”
- ☒ So Ibn ‘Abbās (R) is saying that not only are there Prophets, but there are similarities to the point that there are parallel Prophets. Not necessarily like a multiverse or something, but the idea that there are some similarities.
- ☒ Now, we have to look at the veracity of this claim. Whenever we hear of a hadīth, we should verify its authenticity first.
 - ☒ It is incumbent that whenever someone claims a report, especially attributing it to the Prophet ﷺ, we have to verify it.

SLIDE 19

† Hadīth Critical Methodology - Chain Analysis

- Who is saying this Hadīth? The Prophet ﷺ is not stating this, a companion, Ibn Abbās (R) is stating it. Ibn Abbās is one of the top/best commentators of the Qur’an, known to be the most knowledgeable about the Qur’anic interpretation.
 - ☒ We have to look at where this statement/report is traced back to Ibn Abbās (R).

SLIDE 20

† Sourcing the report - We trace it back and find this mentioned in 4 sources:

- Sources:
 - ☒ Tafsīr Ibn Abī Hātim, Ibn Abī Ḥātim (an early *muḥaddith*)
 - ☒ Tafsīr al-Jabarī, Ibn Jarīr al-Ḥabārī, 23:27 (scholar who collected and shared all the information he could and included it, he did not verify chains of narration etc., he just included it all.)
 - ☒ Mustadrak al-Ḥākim, al-Ḥākim, hadīths 3869, 3869.
 - ☒ al-Asmā wa-l-Sifāt, al-Bayhaqī, hadīths 831, 832.

SLIDE 21

- Chain Analysis -

SLIDE 22

- ❑ Who said it?
 - ❑ Prophetic Reports - Elevated: Marfū (raised because it goes back all the way to the Prophet ﷺ) vs
 - ❑ Halted Reports: Mawqūf (means that the hadīth is halted at the companion, it didn't go all the way to the Prophet ﷺ)
- ❑ How certain is it that they said it?
 - ❑ Conclusively-Established Reports: *Mutawātir* (many companions corroborate the report) and they would be considered to be as authentic as the Quran. Probabilistic-Established Reports: *Khabr Wāhid* (only one companion has reported it)
 - ❑ Compared to another Hadīth chain that has about 8 narrators, Companions, narrating from the Prophet ﷺ and then proliferated on, for example, which is more typical.
 - ❑ Comparing with another *hadīth* chain to show how chains proliferate.
 - ❑ Problem with a *hadīth* not proliferating early on.
 - ❑ This particular report is atypical because there is only one companion at the top of the chain, and then only one narrator from him; no one corroborates Abū al-Duā (*Madar* of the *Hadīth*). [Called a Singularity - only one narrator of the *hadīth*.] (Note: This does not necessarily make this weak or incorrect, this just means that no one supported his claim.)
- Report Origin -
 - ❑ Thinking of the fact that Ibn Abbās (R) is one of the greatest *Tafsīr* scholars, even though Ibn Abbās (R) was the sole Companion that mentioned this information, where did he possibly get his information from?
 - ❑ The high possibility is that he got it from the Prophet ﷺ, due to the integrity of Ibn Abbās (R) and who he is (his track record). We can safely assume this, but still, it is a possibility, not a certainty.

SLIDE 23

- Authenticity of the report - 5 things to look at or consider when examining hadīth
 - ❑ Narrator Analysis:

- ❑ 1. Integrity (*adāla*)
- ❑ 2. Accuracy (*dabt*)
- ❑ Chain Analysis:
 - ❑ 3. Uninterrupted chain (*ittisāl*)
- ❑ Additional Measures:
 - ❑ 4. Absence of isolated discrepancy (*shudhūdh*)
 - ❑ 5. Absence of subtle defects (*'ilaḥ*)

SLIDE 24

† Conclusive (*Qatī*) vs. Probabilistic (*Zannī*)

- *Qatī* (Conclusive): a text that can bear only one meaning
- *Zannī* (Probabilistic): a text that can bear more than one meaning
 - ❑ Even the Verse of other earths is *zannī*, because there were multiple interpretations of the verse.

SLIDE 25

† Establishment (*Thubūt*) (of the Revelatory Source) vs. Meaning (*Dalāla*) [Chart]

1. Establishment (*Thubūt*) - Conclusive (the entire Qur'an and *Mutawaatir Ahadīth* would be conclusive) & Meaning (*Dalāla*) - Conclusive
2. Establishment (*Thubūt*) - Conclusive & Meaning (*Dalāla*) - Probabilistic
3. Establishment (*Thubūt*) - Probabilistic (*Hadīth* lower than *Sahih* in grade, *Khabr Wahid*) & Meaning (*Dalāla*) - Conclusive
4. Establishment (*Thubūt*) - Probabilistic & Meaning (*Dalāla*) - Probabilistic
 - ❑ The verse of the multiple earths would be Conclusive in establishment because it is an verse of the Qur'an
 - ❑ The hadīth about the multiple earths and about similar Prophets both would be probabilistic in establishment.

SLIDE 26

† The Cohesion Question:

- Is the report cohesive with other knowledge evidences?
- Is the report theologically and metaphysically legitimate?

SLIDE 27

- Navigating Apparent Contradictions in Evidences:

Navigating Apparent Contradictions in Evidences			
	RevelatoryEvidence	Empirical / Rational Evidence	Contradiction
1	Conclusive	Conclusive	Impossible
2	Conclusive	Probabilistic	Revelation is understood literally
3	Probabilistic	Conclusive	Revelation is interpreted
4	Probabilistic	Probabilistic	Revelation is understood literally first, but interpretation is possible

SLIDE 28

- Conclusive in both thubūt and dalāla.

SLIDE 29

The evidences that we have looked at here, the hadīth and the verse mentioned, both are in the realm of probabilism as both revelatory evidence and empirical/rational evidence. So what do we do? We try to understand it literally first, but interpretations are possible. So here are some interpretations.

SLIDE 30

- Understanding the Seven Earths Hadīth - Interpretations (Figurative and Literal):
 1. The other earths are the abodes of the Jinn.
 2. Every earth has a different intelligent species.
 3. The Realm of Images (*ālam al-mithāl*) is a link between the realms of the Unseen (*ghayb*) and the Seen (*shahāda*). (Perhaps we cannot observe/see this other realm/earths)
 4. These “prophets” are “warners”, not Prophets in reality. (More like representatives of the Prophets, so they are ‘like’ Ibrāhīm, and they just convey the message given to them.)
 5. These earths & prophets are real, but the details are only known to Allah.

SLIDE 31

† We have to be comfortable with the possibility of any of these being true, without certainty. Revise: We have to be comfortable with uncertainty; it is okay to not know for sure.

■ The level of certainty that is needed is dependent on the intent

- ⊠ If the intention is to know the Creator better through creation, then conclusive (*qatʿī*) evidence is not necessarily needed.
- ⊠ If a foundational question of belief is being addressed, then conclusive (*qatʿī*) evidence would be needed.
- ⊠ E.g., Finality of Prophethood - an essential element of belief

■ For probabilistic topics, the importance of the question is dependent on its weight in the hereafter (*ākhirah* implications). This then determines the level of importance of answering that question.

- ⊠ E.g., Question of organ donation - *ākhirah* will be affected vs.
- ⊠ E.g., Question of whether or not different planets exist - *ākhirah* not affected

Critical Hadīth Methodology: How the Critique of a Hadīth Works

Introduction:

Data permeates every aspect of human life. Therefore, it is crucial to adopt a rigorous methodology for analyzing and verifying sources of information. In today's digital age, where content is easily shared across various platforms, discerning between truth and falsehood is increasingly difficult. The prevalence of misinformation, disinformation, and biased narratives underscores the necessity for individuals to approach information critically. This entails questioning the credibility, reliability, and motives behind the information presented.

Similar concerns gave rise to *muḥaddithūn* (traditionists, or *hadīth* critics) and the development of critical methodologies for evaluating *hadīth* reports. For the traditionists, report criticism wasn't merely a methodology for navigating the present world but, more importantly, a means to securing a favorable outcome in the afterlife.

After the passing of the Prophet Muḥammad ﷺ from this world, there arose a need for the Muslim community to authenticate his traditions, or *sunnah*, an integral component of Islamic law and practice. The most paramount source of the *sunnah* is the body of reports that document the Prophet's statements and actions—the *hadīth*—as observed and preserved by the shining stars he left in his stead—the Companions. But as those who had personal contact with the Prophet (may Allah bless him and grant him peace) passed on and Muslim territories continued to expand, it became clear that the mere preservation of *hadīth* was insufficient. Foreseeing the looming threat of *hadīth* forgery and miscommunication, the *muḥaddithūn* began to standardize a highly critical methodology for *examining* reports to determine what was soundly attributable to the Prophet (may Allah bless him and grant him peace) and what was not.

What Comprises a Hadīth?

A *hadīth* is generally defined as any report containing a statement, action, or tacit approval attributed to the Prophet, or, by extension, his Companions and their Followers. Every *hadīth* has two main components: (1) the action or statement being transmitted, and (2) the source of the action/statement, which is represented by

a chain of reporters who transmitted it. The former is known as the *matn* and the latter as the *sanad*.

1. The *sanad/isnād* (lit. chain) of a *hadīth* is its chain of transmitters, each transmitter using the one before him as a reference, that connects us to the report's content. The two main points of analysis in a *sanad* are:
 - a. the status of each individual reporter (*rāwī*) as a credible source of information (bolded in examples below) and
 - b. the modes of transmission they are using to receive and transmit the report (italicized in examples below).
2. The *matn* (text of the report): This is the actual content of the report that is being passed on from one individual to another (within quotations in examples below). *Hadīth* reports range from being as short as a sentence to as long as an entire detailed unfolding of events.

Take, for example:

- Sarah told me that
 - ↳ Her father told her that
 - ↳ The principal said to him:

"School is canceled tomorrow."

Or, we may use a classical example from the *hadīth* literature:

- Muhammad ibn Ismā'il al-Bukhārī states that:
 - ↳ Abd Allah ibn al-Zubayr al-umaydī narrated to us that he said:
 - ↳ Sufyān narrated to us that he said:
 - ↳ Yahyā ibn Sa'īd al-Ansārī narrated to us that he said:
 - ↳ Muhammad ibn Ibrāhīm al-Taymī told me that he had

heard

 - ↳ Alqamah ibn Waqqa al-Laythī stating: I heard
 - ↳ Umar ibn al-Khattāb on the pulpit when he stated: I

heard

 - ↳ the Messenger of Allah ﷺ state:

"Certainly, deeds are by intentions..."

Critical Evaluation of Hadīth

The task of the muḥaddith in evaluating the soundness of a report involves rigorously evaluating the various components of the *sanad*, or chain of transmission. To achieve this, he leverages his extensive knowledge of narrator biographies and historical timelines, along with a verifiable and critical methodology, to conduct a thorough investigation of the chain. In brief, the muḥaddith considers five

main factors in determining the soundness of a report, two of which relate to the reporter, one which relates to the connectedness of the chain of reporters, and two additional considerations to ensure the absence of anomalies or hidden defects.

These five considerations are the following:

1. The accuracy ('*ab*') of each reporter
2. The probity/moral integrity ('*adāla*') of each reporter
3. An unbroken chain of reports ('*itti'āl*')
4. The absence of anomaly, i.e., the report's contradicting how other reliable reporters transmit the report
5. The absence of hidden defects ('*ila*') that only experts are able to reveal, such as an omission of a reporter in an apparently unbroken chain.

When a report meets these five conditions, it is considered sound (*ṣaḥīḥ*) or fair (*ḥasan*). Otherwise, it is considered weak (*ḍa'īf*) and unsuitable as a legal or theological proof. Weak reports are usable in historical and ethical discussions, unless they are severely weak, in which case they are treated like forgeries or false attributions (*mawḍū'* reports).

Let us use the aforementioned chain as an example to demonstrate briefly how these five considerations are applied:

Before any analysis, the *muḥaddith* first needs to identify the chain within those texts of the hadīth corpus that are considered primary sources. To the onlooker, discovering one *hadīth* amongst thousands of others may seem like finding a needle in a haystack, but for the *muḥaddith* who has spent countless hours familiarizing himself with these texts, this practice becomes second nature. Our particular chain happens to be for the first report that Imam al-Bukhārī brings in his magnum opus, his *Ṣaḥīḥ* collection.

After identifying the chain in al-Bukhārī's *Ṣaḥīḥ*, the *muḥaddith* then proceeds to engage in chain analysis. He begins by working through the chain and identifying each narrator, assuring that each and every one is recognized for their moral integrity and their accuracy in hadīth transmission. While the texts of biographical accounts and narrator criticisms are full of the information, they are all but a reference for the *muḥaddith*, who, after rigorously studying these texts, recognizes these individuals as if they were his own close acquaintances:

- 'Abd Allah ibn al-Zubayr al-umaydī ... “Of course, the great Imām Ḥumaydī; the most famous teacher of Bukhārī, who even accompanied Imam al-Shāfiī in the pursuit of *Hadīth*.”
- Sufyān ... “This is not Sufyān al-Thawrī; as umaydī is the student, this is undoubtedly Sufyān ibn Uyaynah, who has taken hadīth from 70 Tābi‘īn (Followers of the Companions).”
- Yahyā ibn Sa‘īd al-Anārī → Mḥammad ibn Ibrāhīm al-Taymī → Alqamah ibn Waqq al-Laythī ... “All three of these individuals are transmitters from the generation of the Tābi‘īn, Yahyā being the youngest and Alqamah being the eldest. Their reputations precede them.”
- Umar ibn al-Khaṭṭāb ... “Umar, the great Companion of the Messenger of Allah and mighty caliph of Islam, may Allah be pleased with him.”

As each narrator is checked and recognized as a reliable transmitter, the *muḥaddith* also scrutinizes the chain for any trace of an interruption, as an unexplainable missing link in the chain can bring the report’s authenticity into question. The *muḥaddith* again must tap into his knowledge of the expansive network of hadīth transmitters, along with their birth and death dates, taking note of the likelihood that each narrator in the chain could truly have met the one he claims to transmit from (*liqā’/samā’*). In the case of our example, the student-teacher relationship between every two individuals is well established.

The *muḥaddith* moves on to the final step, which is to investigate whether the chain contains any hidden problems or is anomalous.

- The nature of hidden problems is that they are commonly only privy to those experts who are contemporaneous to the source of the problem. The *muḥaddith* will reference the works of these experts that preceded him to rest assured that there were no issues with the chain in question.
- Anomalies are only discovered through comparative chain analysis (*i’tibār/takhrīj*), where the *muḥaddith* now must seek out any and all other chains for this report so as to corroborate it is content. If, for example, he discovers that this chain is transmitting contrary to the vast majority of chains, it would raise a concern that someone must have made an error. Here is a scan of just one example of what the cross-chain analysis of a hadīth can look like when mapped out:

Some of the many questions that the muḥaddith seeks to answer, alongside their related terminologies in the science of hadīth critical methodology, include the following:

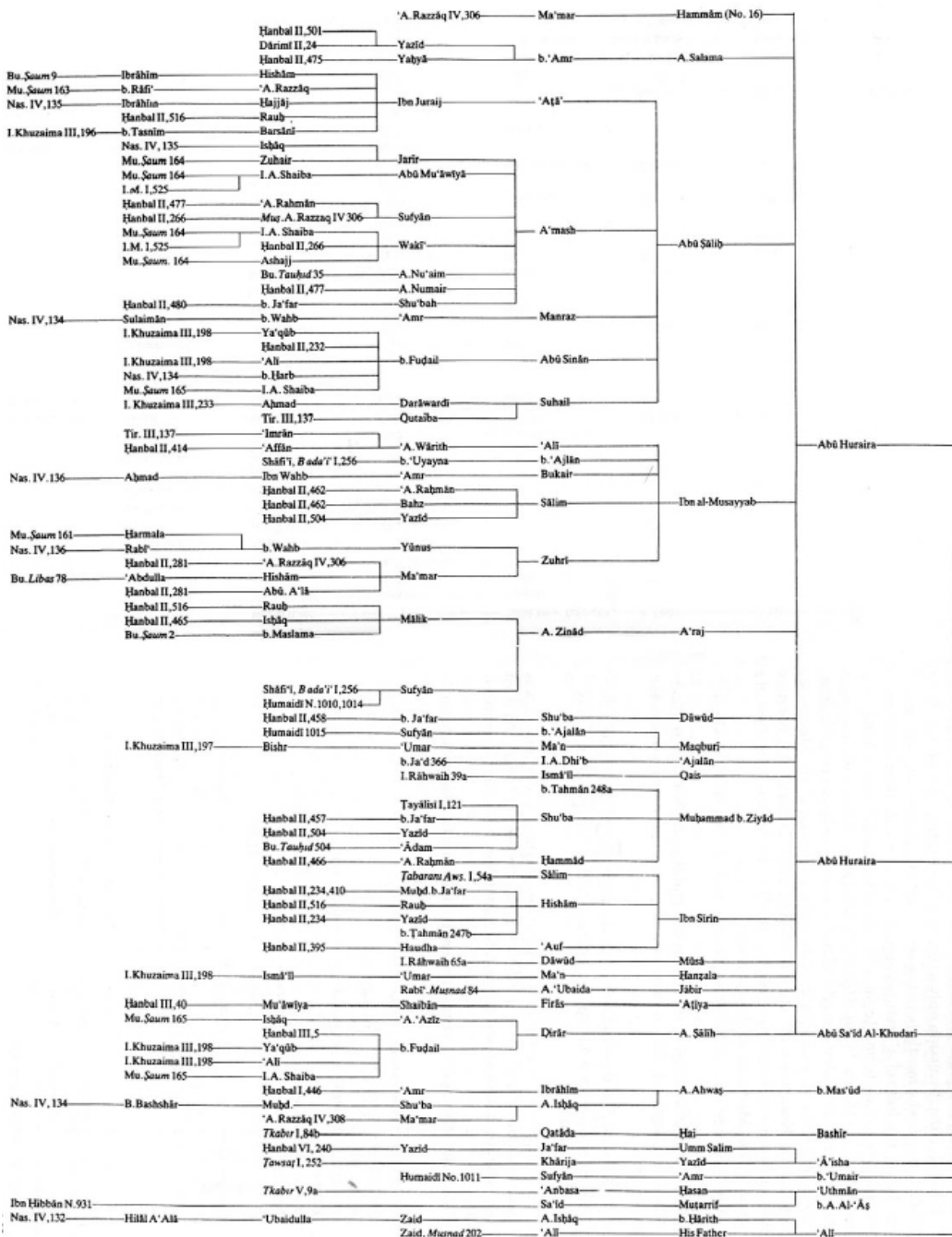
1. *Jahālah* (being unknown) vs. *Shuhrah* (being well-known): Is the reporter known? Do we know their name, status as a reporter, distinguishing characteristics? How well is the individual recognized as a transmitter of reports? Do experts vouch for them?
2. *'ab* (accuracy): Is the reporter known for having strong or weak memory? If they transmit reports using written documentation, are their documents reliable? Did the reporter consistently report accurately throughout their life, or did senility or loss of documents affect their transmission?
3. *'Adālah* (probity, integrity): Is the reporter unknown to have orthodox or unorthodox beliefs? Is he righteous and dignified in his comportment?
4. *Kidhb* vs. *'idq*: Is he known to fabricate reports? Is he known to lie in other facets of life?
5. *Gharābah* & *Shudhūdh*: Are there corroborative chains for this report? Have the peers of this reporter transmitted contrary to him despite having the same source?
6. *Inqi'ā'* vs. *Itti'āl*: Is there any omission in the chain? Is it possible for this alleged student to have met the teacher he claims to have taken from? Is the omission problematic?
7. *'aml* & *Adā'*: Does the wording of the chain of transmission indicate any sort of omission?

Hadīth Content Evaluation

Following this rigorous chain analysis is a detailed examination of the report's content, which is often left to the *faqīh*, or legal expert. This involves comparing the report's content against other reports and legal evidence of varying epistemic values, to ultimately ascertain its significance within the framework of Muslim belief and ritual practices.

Some of the questions the legal expert will seek to answer regarding the content of the report include the following:

1. *Ta'āru*: Does the wording of the report contradict that of other reports on the same topic? How can we make sense of both?
2. *Tarjī* & *Tawīl*: Does the report apparently contradict what is known from certain sources, such as the Qur'an, sound reason, or truly empirical data? How can we harmonize our understanding of them all?



The Prophet

3. *Naskh*: Does the content of the report relate to laws of early Islam which were later abrogated?
4. *Amal al-aābah*: Does the practice of the companions of the Prophet seem to show that the report is of a practice that was irregular?
5. *Qiyās al-Uūl & Qawāid*: Do the principles extracted from the evidences of the religion as a whole support the apparent meaning of the report?
6. *Umūm al-Balwā*: Is the report from a single chain despite it is content pertaining to a matter that should be privy to the majority of people?

Unit 6: Lesson 1 - Assessment

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. Astrobiology is solely concerned with the study of planets outside our solar system. TRUE FALSE
2. The concept of 'Seven Earths' in Islamic theology can be interpreted in multiple ways. TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. Which of these is an example of Empirical Evidence?
 - a. A philosophical argument
 - b. A religious text
 - c. Observational data from a telescope
 - d. An untested hypothesis
4. The concept of 'Seven Earths' in Islamic theology is an example of which type of evidence?
 - a. Rational
 - b. Empirical
 - c. Revelatory
 - d. Statistical
5. In Islamic theology, the concept of 'Seven Earths' primarily relies on which type of evidence?
 - a. Empirical
 - b. Rational
 - c. Anecdotal
 - d. Revelatory
6. The search for extraterrestrial life involves which of the following scientific disciplines?
 - a. Biology and Chemistry
 - b. Physics and Geology
 - c. Astronomy and Biology
 - d. All of the above

7. What type of knowledge would a scientist's belief in the existence of extraterrestrial life be categorized as, considering the current lack of conclusive evidence?
 - a. Conclusive Knowledge
 - b. Probabilistic Knowledge
 - c. Empirical Knowledge
 - d. Theoretical Knowledge
8. The integration of science and theology in the study of extraterrestrial life helps in:
 - a. Resolving all scientific mysteries
 - b. Deepening the understanding of the universe from multiple perspectives
 - c. Proving the existence of extraterrestrial beings
 - d. Rejecting any scientific claims that contradict theological beliefs

Section 3: Short Answer - Write a well-formulated response for each of the following.

9. Explain the difference between 'probabilistic' and 'certain' knowledge in the context of extraterrestrial life.
10. How might the motivations for exploring extraterrestrial life differ between scientists and theologians?

11. Discuss how the lesson on extraterrestrial life can help us understand human uniqueness. Include both scientific and theological perspectives.
12. Describe your personal motivations that might influence the way you as a researcher would approach the question of extraterrestrial life. Present your thoughts to the class.

Unit 6: Lesson 1 - Assessment (Teacher's Edition)

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. Astrobiology is solely concerned with the study of planets outside our solar system. TRUE > FALSE
2. The concept of 'Seven Earths' in Islamic theology can be interpreted in multiple ways. > TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. Which of these is an example of empirical evidence?
 - a. A philosophical argument
 - b. A religious text
 - c. *Observational data from a telescope •*
 - d. An untested hypothesis
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 - b. *Deepening the understanding of the universe from multiple perspectives •*
 - c. Proving the existence of extraterrestrial beings
 - d. Rejecting any scientific claims that contradict theological beliefs

Section 3: Short Answer - Write a well-formulated response for each of the following.

9. Explain the difference between 'probabilistic' and 'certain' knowledge in the context of extraterrestrial life.
Probabilistic knowledge refers to conclusions based on likelihoods and chances, such as the probability of extraterrestrial life existing based on current evidence about the number of planets and stars. Certain knowledge is definitive and indisputable, often lacking in the field of extraterrestrial research due to the current limit of scientific discovery and evidence.
10. How might the motivations for exploring extraterrestrial life differ between scientists and theologians?
Scientists may be driven by a desire to understand the universe, driven by empirical evidence and curiosity. Theologians might explore extraterrestrial life to understand its implications on religious beliefs and texts, seeking answers about creation and the role of humanity in the universe.

11. Discuss how the lesson on extraterrestrial life can help us understand human uniqueness. Include both scientific and theological perspectives.

Answers will vary. They should include scientific aspects like the rarity and conditions required for life, and how we are unique in intelligence even among the creatures of this earth. Theological aspects would include the Prophet ﷺ being the best and most intelligent of all of creations.

12. Describe your personal motivations that might influence the way you as a researcher would approach the question of extraterrestrial life. Present your thoughts to the class.

Answers will vary.

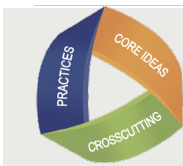
UNIT 6: ARE HUMAN BEINGS UNIQUE IN THIS UNIVERSE?

Science and Theological Inquiry about Extraterrestrial Intelligent Life

Unit 6:
Lesson: 2

Time
Length:
45–50 min

Lesson 2 - Human Uniqueness and How Certain is Extraterrestrial Life



NGSS Instructional Outcomes

Next Generation Science Standards

HS-ESS1 Earth's Place in the Universe: This standard is relevant as the lesson deals with the concept of extraterrestrial life and the vastness of the universe, which are central to understanding Earth's place in the cosmos.

HS-LS4 Biological Evolution: Unity and Diversity: The exploration of human uniqueness and the potential for diverse forms of life in the universe can be linked to this standard, which focuses on the diversity of life and its evolutionary processes.

Science and Engineering Practices:

The lesson engages students in practices such as asking questions, analyzing and interpreting data, constructing explanations, and engaging in arguments from evidence, particularly when discussing the likelihood of extraterrestrial intelligence and the implications of such findings.

Crosscutting Concepts:

The lesson involves crosscutting concepts like "Cause and effect" and "Systems and system models," especially in discussing human uniqueness, from a scientific lens as well as a theological framework that underpins our understanding of the universe and a human's role/involvement within it.



CCSS Instructional Outcomes

Common Core State Standards

CCSS.ELA-Literacy.RST.11-12.1: Citing specific textual evidence to support analysis of science and technical texts, especially in discussing theological and scientific views on extraterrestrial life.

CCSS.ELA-Literacy.RST.11-12.7: Integrating and evaluating multiple sources of information presented in diverse formats and media, such as the comparison of different philosophical viewpoints on human exceptionalism.

CCSS.ELA-Literacy.RST.11-12.8: Evaluating the hypotheses, data, analysis, and conclusions in a science or technical text, which aligns with evaluating the likelihood of extraterrestrial life and human uniqueness.

CCSS.ELA-Literacy.SL.11-12.1: Initiate and participate effectively in a range of collaborative discussions with diverse partners on complex topics, which applies to the group discussions and analysis of the video content in the lesson.

Content Learning Outcomes:

1. Describe & explore the underlying motivations to pursue specific fields of inquiry.
2. Describe & explain the underlying motivation for Muslims to pursue intellectual questions.
3. Evaluate how applying Islamic epistemology informationrms questions.
4. Explain & evaluate the potential theological implications of scientific questions

Materials:

- † Presentation Slides (Slides 32-44)
- † Triple-Entry Vocabulary Journal (Student Responsibility)
- † Video: Other Earths: The Search for Habitable Planets - 4k
- † Comprehending “Human Exceptionalism” - Supplemental Material

Instruction/Teacher Facilitation:

- † Last time we looked at some of the scientific knowledge and the revelatory knowledge that surrounds this topic of ETI. Through the case of the seven earths, and through hadīth analysis, we saw the realm of possibilities but no certainties. And we were left with being comfortable with uncertainty. The question then arises: Are there any certainties in this discussion of extraterrestrial life or intelligence? Well, we mentioned conclusive knowledge and evidences last time.
- † Ask Students: Is there conclusive knowledge that we should look at that would help us in giving some definiteness to this discussion of ETI? Think on a theological level. What are some Aqīda-related questions that might have come up in your mind? Would accepting ETI contradict what we believe about ourselves or what Allah SWT has told us about ourselves? Are there any contradictions about what we are told about the Prophet ﷺ?
- † Theological and Metaphysical Legitimacy
 - Scholarly consensus: “The best of all creation without exception is our Prophet ﷺ, so avoid violating scholarly consensus”. (Jawharat al-Tawīd)
 - Challenges to prophetic superiority - this is something we believe; that the Prophet ﷺ is the superior being, among humans and jinn. There is no alien/intelligent being that can be superior or more intelligent than the Prophet ﷺ, he is the peak of intelligence.
 - ⊠ Concerning the question of who is more intelligent between humans and jinn, the answer is clearly humans because of the fact that the final Prophet, the Prophet ﷺ, was a human. And jinn too are obligated to accept and follow the Prophet ﷺ
 - ⊠ Also, there has been subjugation of jinn by humans, Prophet Sulaiman (A) controlled jinn, and the Prophet ﷺ also subjugated jinn.
 - Human uniqueness: We have created humans in the best of forms and still reduced them to the lowest of the low. (Surāh At-Tīn 95: Verse 4-5). (For further discussion on the concept of Human Uniqueness, view Comprehending “Human Exceptionalism” on page 295.)

SLIDE 32

- † In Summary - What Does Revelatory Evidence Tell Us?

SLIDE 33

- What We Know Conclusively
 - ☒ Existence of Intelligent Creatures: Man, Jinn, and Angels
 - ☒ The Multiplicity of Worlds and Realms
 - ☒ Vastness of the Universe
 - ☒ The specialness of the Prophet Muhammad

SLIDE 34

† What We Know Probabilistically

- ☒ Broad metaphysical possibility of the existence of extraterrestrial intelligent life.
- ☒ It is theologically possible for extraterrestrial intelligent life to exist.
- ☒ Multiple earths and even multiple prophets do not necessarily challenge the finality of prophethood or the specialness of the Prophet Muhammad ﷺ

SLIDE 35

- All conclusive knowledge is cohesive.
- Speculation is not problematic if emerging from a sound, strong epistemological framework.

SLIDE 36

† Scope and Motives of Scientific Inquiry:

- Ask Students:
 - ☒ What assumptions underlie the search for extraterrestrial intelligent beings? (i.e., Why should we care about this? Why did this question even come up? Who came up with this question in the first place?) - For example, we saw from an Islamic perspective that Muslim scholars looked into it because of Waḥy.
 - ☒ What are the reasons and motivations for exploring any topic?

SLIDE 37

- Scan QR code to watch Video: Human Exceptionalism – Aristotle versus Epicurus Other Earths: The Search for Habitable Planets - 4K



- Prior to watching, ask students to pay attention or listen to the philosophical roots of the search of ET life. (As scientists, everything we inquire about or search/research has philosophical roots or reasons, the answer to “why.” Helps us see if our views are similar or different.)
- ☒ Watch the video from 0:00 to 6:20
- ☒ Post Video Discussion:
 - ☒ Human Exceptionalism – Aristotle versus Epicurus
 - Aristotle also believed in human exceptionalism, and due to this, he believed Earth to be the center of the universe, and a unique place (meaning no other place like it).
 - If any being did exist, they were not as special as humans.
 - This differed greatly from Epicurus’ view.

SLIDE 38

- ☒ The philosophy of Epicurus (341–270 BCE) was a complete and interdependent system involving:
 - The goal of human life: happiness, resulting from the absence of physical pain and mental disturbance - to live stress-free or carefree, with no limit is
 - An empiricist theory of knowledge - sensations, together with the perception of pleasure and pain, are infallible criteria - only what he could experience with his 5 senses was true knowledge.
 - Description of nature based on atomistic materialism, and a naturalistic account of evolution, from the formation of the world to the emergence of human societies - life is based on material things that you can observe.

SLIDE 39

- ☒ Based on radical materialism, Epicurus attempted to:
 - Disprove the possibility of the soul’s survival after death, and hence the prospect of punishment in the afterlife - no life after death (contrast this with our Islamic belief of the soul surviving death; almost everything we believe in depends on the afterlife) He felt that if he could disprove this, no accountability, life

would then become very easy, stress-free. Resulting in what we call today as Hedonism.

- Disregard transcendent concepts like Platonic Ideas or Forms
- Eliminate fears of death and punishment, thus leaving people free to pursue the pleasures, both physical and mental, to which they are naturally drawn, and achieve satisfaction.

SLIDE 40

- ☒ Why is this Epicurean philosophy important to know? - NOT because this is the right philosophy, but because much of this thought is behind scientists and astronomers who built these telescopes (they call themselves neo-epicureans because they ascribe to this philosophy).
- ☒ Epicurus advised on the 'proper' attitude toward:
 - Politics (avoid it where possible)
 - The gods (do not imagine that they concern themselves about human beings and their behavior) - even if there was a God or gods, they would have just created things and left us alone, "do not worry about the details" view
 - The role of relations and marriage (dubious) - just another hassle
 - Various meteorological and planetary phenomena (best to keep an open mind in the absence of decisive verification) - he wanted to see diversity in creation, in planets, etc.. to prove that humans are not that special.
- ☒ Not all scientists think this way or agree with Epicurus, but this is a very real and widely-adopted philosophy.

SLIDE 41

- What is the Motivation Behind the Inquiry?
 - ☒ What is the connection between creation and the Creator?
 - ☒ Is it just pure curiosity, because we are curious beings?
 - ☒ Immediate need? To fulfill a need or replace/replenish a need (e.g. gas, food)
 - ☒ What does pursuing this inquiry cost? These decisions have a lot to do with how money/funds are allocated for various

things in society. We as Muslims should be very concerned with this to make sure we are using our resources in the best way.

- ☒ Motivations are usually not spoken about, you have to search for them and find them.

SLIDE 42

- The US government spends an average of \$55 billion on space exploration, a year.

- ☒ Ask students to name some aspect of society that they care about. (e.g. poverty, housing, climate, etc...)
- ☒ How much would it cost to fix this problem? (The teacher can look up this information accordingly.)
- ☒ E.g., Childhood Poverty in America, Global Warming - worth your time to find out how much it costs to fix it because it is something you care about.

SLIDE 43

- What Else Could \$54 Billion Do?

- ☒ End world hunger? According to the U.N. World Food Programme:
 - ☒ 828 million people on the planet are hungry. That's 1 in 10 people.
 - ☒ Of those, 50 million people are on the brink of famine and desperately need help.
 - ☒ \$7 billion is needed to deliver food to the millions of people facing famine this year.
 - ☒ \$40 billion per year is needed to feed all the world's hungry people and end global hunger by 2030.
- ☒ End homelessness? According to US Housing and Urban Development:
 - ☒ \$20 billion end homelessness in the US (only half of NASA's budget)
- ☒ Americans spend more than \$35 billion a year on gym memberships
- ☒ The U.S. spends around \$718 billion on it is military in 2019 alone

- But, what are we spending this money on? Space Exploration
This gives us an idea of the scale of importance in the eyes of scientists or the eyes of the American government.

- ☒ So the two biggest spending allocations are NASA and the military.
- ☒ On an ideal level, is this considered a good use of resources?

- In summary:

- ☒ We understand the epistemology for inquiring into ETI - from our own Muslim traditions, we see that we have reasons to ask these. Similarly, we see curiosity in seeking answers to these questions in the field of science.
- ☒ We looked at Epicurus and his philosophy to get us to think, WHY are we studying this? What are we trying to prove? And maybe, other scientists might be trying to disprove something that we fully believe.

SLIDE 44

- As Muslim scientists, would we ask different questions? - We should understand that our theology can inform the science that we think will be helpful/beneficial.
- Our goal as Muslim scientists is to find out what would be beneficial to society, and aim to look into that and how can we participate in moving that forward.
- This all takes intention, effort, and a lot of hard work!

Human Exceptionalism:

Human Exceptionalism is a loaded term that has implications in a theological sense as well as in an evolutionary/scientific perspective.

Epistemic Understanding of Human Exceptionalism:

- † Human exceptionalism is a concept that acknowledges the uniqueness of humans. It asserts that humans, as a species, possess certain characteristics or attributes that set them apart from other living organisms. Some key aspects of human exceptionalism include:
- † Cognitive and Intellectual Abilities: Human exceptionalism recognizes that humans have significantly advanced cognitive and intellectual abilities compared to other species. This includes complex thinking, problem-solving, language, and the development of advanced cultures and societies.
- † Moral and Ethical Reasoning: Humans possess and emphasize the development of moral and ethical reasoning, which has led to complex ethical systems and the ability to ponder questions of right and wrong.
- † Self-awareness and Consciousness: Humans are believed to possess a high level of self-awareness and consciousness, enabling them to reflect on their own existence, the nature of reality, and their place in the world.
- † Religious and Spiritual Beliefs: Many proponents of human exceptionalism argue that humans have a unique capacity for religious and spiritual beliefs, often resulting in the search for meaning and purpose in life.

Theological Understanding of Human Exceptionalism:

- † The theological perspective combines all of these key elements mentioned epistemically and adds on the fact that humans have been favored with divine guidance through human messengers who instruct moral and ethical reasoning privileged to human beings.
- † [Note: There is some overlap between humans and jinn in some of these key aspects, but because we do not have access to much knowledge, especially empirical knowledge about the jinn,

we are not discussing them here and are focused on speaking of exceptionalism in the context of humans versus other creation that we can observe.]

- **Divine Creation:** The belief in the special creation of the first human, Adam (A), and subsequently the first woman, Hawwā' (A), as described in religious texts. This is clearly mentioned in the Qur'an 38:71-71, 75. [This creation event is seen as distinct from the natural processes of evolution.]
- **Best Form:** Waḥy (revelation) describes the human being to be in the best form, proportionately designed, in perfect measures. As mentioned in the Qur'an: "We have created humans in the best of forms" (Surāh At-Tīn 95: Verse 4). This 'best form' places human beings on an exceptional level in comparison to other creations and living beings.
- **Speech:** The ability of humans to communicate in a linguistic manner, vocally as well as through literature, is another unique quality. In Surāh Ar-Rahmān (55:2-3) Allah SWT explains that "He has created man. He has taught him eloquence (how to express himself)."
- **Knowledge:** Connecting back to Adam (A) as the first of all human beings, in Surāh Al-Baqarah (2:31), Allah SWT says: "He taught Adam the names of all things, then He presented them to the angels and said, 'Tell Me the names of these, if what you say is true?'" This particular verse highlights the knowledge and wisdom granted to Adam (A) by Allah SWT directly. The angels, in contrast, were unable to provide the names, emphasizing the unique knowledge bestowed upon Adam (A).
- **Humanity's Special Relationship with God:** Humans have a unique relationship with their Creator and are distinct from other creatures by way of what has been bestowed on them. Human beings have been given divine guidance via scriptures and Prophets/Messengers, characteristic of Divine Mercy. This ties further to human salvation and a return to their previous dwelling place (with Allah SWT in Jannah). This emphasizes the importance of moral and spiritual considerations in human existence. Human exceptionalism also refers to one's ability to receive knowledge of Waḥy (expanded source of knowledge) not given to other creations.
- **Human Responsibility:** This exceptional status that humans have been given comes with a level of responsibility and authority in this world.

- ✘ Human beings are bound by the Sharī'a and it is injunctions and have a responsibility to implement it, uphold it, and spread it.
- ✘ The earth has been designed to cater to our needs as humans, therefore, we have the right to take of what is needed. It is also an amanā (a trust) and therefore resources should be used according to the Sharī'a.
- ✘ Humans have been assigned the responsibility/obligation to uphold the rights of others and the rights of Allah SWT on this earth.

There is an understanding of different levels of exceptionalism even amongst humanity:

- † Exceptionalism of all Humans: Allah SWT says in the Qur'an (Surāh Al-Israa, 17:70). "And Indeed We have honored the children of Adam, and carried them on the land and sea, and granted them good and lawful provisions, and preferred/privileged them far above many of Our creatures." Islamic belief also stipulates humans as God's deputies (khalīfah) on earth. This is iterated in Surāh Baqarah 2:30 where Allah SWT states to the angels, "I am going to create a deputy/successive authority on the earth." From these verses, we see that human beings have been honored as well as given authority above other creations on this earth.
- † Exceptionalism of the Believer: From amongst the general collective of humans, there is a special hierarchy given to the believing people, particularly Muslims over the non-believers. Human exceptionalism is closely linked to religious beliefs about human salvation and the relationship between humanity and God. The choice to believe and actually believe in God is what elevates the status of human beings in the eyes of God. As mentioned in the Qur'an, Allah SWT states, "O mankind, indeed We have created you from male and female and made you peoples and tribes that you may know one another. Indeed, the most noble of you in the sight of Allah is the most righteous of you (who has taqwā). Indeed, Allah is Knowing and Aware." Taqwā, God-consciousness, can only truly be achieved by a believer. Allah SWT further says in the Qur'an, "And it is He who made you the vicegerents of the earth and raised some of you in ranks over others, so that He may test you in what He has given you. Surely, your Lord is swift in punishing and - surely He is Most-Forgiving, Very-Merciful." (Surāh Al-An'am 6:165)
- † Prophetic Exceptionalism: From among the believers, a group is elevated, which are the prophets of God. There are specific aspects that distinguish prophets in Islam as exceptional individuals

chosen by God to fulfill the critical role of guiding humanity. Their lives, teachings, and the divine support they received are central to Islamic belief and serve as a foundation for moral and spiritual guidance.

- **Divine Selection:** Prophets are chosen by God for their roles. The Qur'an emphasizes that Prophets are selected by God's will to deliver His message to humanity. Their leadership is divinely inspired, aiming to bring people closer to God and to establish societies based on justice and righteousness.
- **Moral and Ethical Excellence:** Prophets are depicted as models of moral and ethical excellence. They are known for their honesty, integrity, patience, and trustworthiness. Their characters are meant to serve as examples for all people to follow. Islamic teachings assert that Prophets are protected by God from committing major sins, especially those that could undermine their credibility and the divine message they carry. This concept, known as 'ismah (divine protection), ensures that Prophets maintain a high level of integrity and are reliable conveyors of God's message.
- **Revelation Receivers:** Prophets are unique among humans in that they receive *Waḥy* (revelation) from God. These revelations, which come in the form of scriptures or divine instructions, are meant to guide humanity. The Qur'an itself is considered the final revelation, given to Prophet Muhammad ﷺ.
- **Miracles:** Many Prophets are associated with miracles, which serve as signs of their prophethood and the truth of their message. These miracles, granted by the will of God, are beyond the capability of ordinary humans. For example, Musa (A) parting the Red Sea (Surāh al-Shu'ara 26:63) and Īsā (A) healing the blind and the leper (Surāh Al-Imran 3:49) are miracles attributed to them in the Qur'an.
- ع **The Exceptional amongst the Exceptional:** There are five Prophets that are recognized as even more exceptional, which has been termed *أُولُو الْأَعْزَمِ* "Possessors of Resolve/Steadfastness." Of these five, which include Nūh (A), Ibrāhīm (A), Musa (A), Īsā (A) and Muhammad ﷺ; the most exceptional of them all being Muhammad ﷺ. The Qur'an describes the Prophet Muhammad ﷺ as "the most beautiful example" for those who hope in Allah and the Last Day (Surāh Al-Ahzab 33:21).
- † **Exceptionalism of the Last Prophet, Muhammad ﷺ:** From the special, elevated class of the Prophets, there is only one that is the most elevated human being, which is the Last and Final Prophet, Muhammad ﷺ. There is unanimous agreement amongst

Muslim scholars that the Prophet ﷺ is the greatest of creation in status before Allah SWT, and no other created being has any status that is higher than his or any power of intercession that is greater than his. In the effort to summarize the exceptionalism of the Prophet ﷺ here are a few of the honors given uniquely to him: Allah SWT took him as a close friend (khalīl); He made him the Seal of His Messengers; He revealed the best of His Books to him, and made his message one that applies to both mankind and the jinn until the Day of Resurrection; He caused miracles to happen at his hand that superseded those of all the Prophets who came before him; he will be the leader of the sons of Adam (on the Day of Resurrection), the first one for whom the grave will be opened, and the first one to intercede and the first one whose intercession will be accepted; in his hand will be a banner of praise on the Day of Resurrection; he will be the first one to cross al-siraat (a bridge across Hell), the first one to knock at the gate of Paradise and the first one to enter it, amongst many other unique characteristics and miracles that are mentioned in the Qur'an and Sunnah. The fact that the Prophet ﷺ is a human being gives honor and elevation to the human race.

- † Exceptionalism of Islam: Of all the religions and ways of life, Islam is singled out as the exceptional and only true dīn and way of life. There is a particular appreciation of being Muslim and following all the prophets up to the very last Prophet, Muhammad ﷺ - (Surāh Maidah 5:3) "This day I have perfected for you your religion and completed My favor upon you and have approved for you Islam as religion." Bestowing the perfected religion of Islam upon human beings is a completion of all the favors previously given to human beings by Allah SWT (as listed above).

[NOTE: Due to the multiple understandings and perspectives the term Human "Exceptionalism" can take on, we have opted to use the term "Human Uniqueness" for clarity when referring to the theological exceptionalism of human beings (in reference to Unit 6 lessons).]

Evolutionary/Biological Understanding of Human Exceptionalism:

An evolutionary biologist would likely define human exceptionalism in terms of unique evolutionary developments that set humans apart from other species. This could include advanced cognitive abilities, complex language, culture, and social structures, as well as the use of tools and technology. From this perspective, human exceptionalism is not a statement of humans being "better" than other species, but rather an acknowledgment of the distinct

evolutionary path and capabilities that humans have developed over millions of years of evolution.

- † This runs against traditionally held Islamic beliefs, particularly the belief that the origins of humankind began with the miraculous creations of Adam (A) and Hawwā' (A) by God.
- † In order to address this discrepancy, Muslim scholars and scientists have examined ways in which the divine creation of human beings can be juxtaposed into the traditional evolutionary perspective as well as where red lines must be defined.
- † One such Muslim scientist is Dr. Shoaib Ahmed Malik, who argues that a theology-centric approach can assist in reducing the observable tensions, thus facilitating the understanding of Islam and evolution. In his book, "Islam and Evolution: Al-Ghazālī and the Modern Evolutionary Paradigm," Dr. Malik explores various aspects of the Islamic perspective on evolution. In this context, he discusses two concepts: human exceptionalism and Adamic exceptionalism.

Human Exceptionalism vs Adamic Exceptionalism

- † Here the terms "Human Exceptionalism" vs "Adamic Exceptionalism" have very specific connotations in the discussion of evolution and Islam, how (if at all) evolutionary processes apply to humans.

■ Human Exceptionalism: an isolated species, no evolutionary connection

- ☒ This concept generally refers to the belief that humans are fundamentally different from and superior to other animals, owing to unique qualities such as rationality, morality, language, or a soul.
- ☒ In many religious and philosophical traditions, human exceptionalism is based on the idea that humans have a special place in the universe or a unique relationship with the divine.
- ☒ Therefore, humans are an exception to evolutionary processes and are not part of the Phylogenetic Tree of Life, eliminating humans from the idea of common ancestry.
- ☒ Scientists call this widely spread way of thinking about the human-nature relationship "human exceptionalism"—when people believe that they exist independently of the ecosystems they live in and draw a sharp line between themselves and what is considered nature.

† Adamic Exceptionalism: maintains Adam (A) (and Hawwā' (A)) as direct divine creation, but postulates that their descendant humans could have interbred with other hominins (who were already present on earth which were results of the evolutionary process).

- Adamic exceptionalism, particularly in an Islamic context, refers to the idea that while humans in general may not be exceptional compared to other animals, the first human, Adam (A), is. This belief holds that Adam (A) was created in a unique way (directly by God) and endowed with special qualities or a special role that subsequent humans did not inherit in the same way.
- Qur'anic Interpretation: (A) primary source of evidence for Adamic exceptionalism in Islamic thought comes from interpretations of the Qur'an. The Qur'an describes the creation of Adam in a way that is often seen as distinct from the creation of other beings. Proponents of Adamic exceptionalism might argue that this narrative indicates a special, non-evolutionary creation for Adam (A) and his wife Hawwā' A.
- Theological arguments for Adamic exceptionalism often revolve around the unique status of humans in the Islamic worldview, particularly regarding spiritual, moral, and intellectual capacities. The creation of Adam is sometimes seen as the point at which these unique human qualities were introduced, qualities that are not a product of evolutionary processes.
- This approach can reduce tensions because, while acknowledging evolutionary science, it maintains the theological stance on creation.
- It is very important to note that Adamic exceptionalism is not substantiated by any revelatory evidence and is not supported by any classical authorities in the fields of tafsīr, ḥadīth, kalām, or even ta'awwuf. On the other hand, this idea of Adamic exceptionalism does not contradict revelatory evidence either. Therefore, since there is no information regarding it (for it or against it), as Dr. Malik clearly states, we would have to do tawaqquf (which is suspending judgment on the matter until more substantial information is obtained).
 - ❏ One cannot make claims about the ghaib (unseen) without scriptural references.
 - ❏ When making a claim about a theological aspect (in this case about things God has or has not done in the past), very clear scriptural references are needed. [If scripture does not say anything about a matter, it cannot be turned into a

theological issue.] This is the understanding of Tawaqquf in the theological sense.

- ☒ Affirmation and negation are impossible.
- ☒ The point to consider is that there is a difference between the theological human and the biological human being. [These two categories may or may not be the same.]
 - ☒ Adam (A) and Hawwā' (upon her be peace) and their descendants are theological certainties due to clear scriptural texts. All human beings can be traced back to them as well.
 - ☒ In terms of the biological human being, tawaqquf is done due to no scriptural mention. [Therefore, the concept of pre-existing humans or human-like beings existing due to an evolutionary process is something that could have or could not have happened. No scriptural basis to confirm either position of what coexisted.]

† In the book "Islam and Evolution," these concepts are discussed at length in relation to Islamic theology and how it intersects with modern evolutionary theory. Human exceptionalism might be contrasted with evolutionary perspectives that do not inherently set humans apart from other animals, while Adamic exceptionalism provides a way to integrate the specific Islamic creation narrative of Adam (A) into a broader acceptance of evolutionary processes.

† For a quick review and explanation, please scan the QR code to view: [Islam and evolution with Professor Shoaib Ahmed Malik](#), starting from 24:08



- 24:58 - Four Positions on evolution
- 25:32 - Creationism
- 27:58 - No Exceptions
- 28:41 - Human Exceptionalism
- 30:06 - At what time did Adam (A) exist?
- 33:04 - Academic Exceptionalism
- 46:50 - Qur'anic vs Scientific Perspective*

Unit 6: Lesson 2 - Assessment

Section 1: True or False - Indicate whether each of the following statements is TRUE or FALSE.

1. Human exceptionalism supports the idea that humans are the most intelligent beings in the universe. TRUE FALSE
2. Aristotle believed in the uniqueness of Earth in the universe. TRUE FALSE

Section 2: Multiple Choice - Choose the correct answer for each of the following questions.

3. What is the primary subject of astrobiology?
 - a. The history of space exploration
 - b. The study of life beyond Earth
 - c. The physics of black holes
 - d. The chemical composition of stars
4. According to Islamic theology, who is considered the best of all creation?
 - a. Angels
 - b. Jinn
 - c. Prophet Muhammad (peace be upon him)
 - d. Human beings in general
5. What philosophical view did Epicurus hold about life on Earth?
 - a. The Earth is the center of the universe
 - b. Life exists only on Earth
 - c. The goal of life is happiness and pleasure
 - d. There is no death
6. The philosophical view that emphasizes sensory experience as the primary source of knowledge is known as:
 - a. Rationalism
 - b. Empiricism
 - c. Existentialism
 - d. Nihilism

7. Which statement best describes the theological stance on the existence of extraterrestrial life in this lesson?
 - a. It is definitively proven by religious texts.
 - b. It is categorically denied by religious scholars.
 - c. It is considered a broad metaphysical possibility.
 - d. It is only supported by certain religious denominations.
8. According to the lesson, how does the concept of human exceptionalism relate to the search for extraterrestrial life?
 - a. It supports the likelihood of finding intelligent extraterrestrial life.
 - b. It questions the intelligence of any potential extraterrestrial life.
 - c. It has no impact on the scientific search for extraterrestrial life.
 - d. It is used to justify the prioritization of space exploration.
9. In the context of the lesson, the belief in human exceptionalism is challenged by the philosophy of:
 - a. Aristotle
 - b. Socrates
 - c. Epicurus
 - d. Plato
10. What does the lesson suggest about the relationship between science and theology in exploring extraterrestrial life?
 - a. Science and theology are fundamentally incompatible.
 - b. Science provides proof for theological claims.
 - c. Theology can inform scientific inquiries and vice versa.
 - d. Theological perspectives are irrelevant in scientific research.
11. The concept of 'Seven Earths' in Islamic theology is an example of what type of knowledge?
 - a. Empirical
 - b. Theoretical
 - c. Revelatory
 - d. Rational

12. The lesson's discussion on the allocation of resources for space exploration highlights what aspect of scientific research?
 - a. The inefficiency of space research
 - b. The prioritization of scientific curiosity and inconspicuous motivations
 - c. The necessity of space exploration for human survival
 - d. The role of political influence in scientific endeavors

Section 3: Short Answer - Write a well-formulated response for each of the following.

13. Describe the concept of 'Multiplicity of Worlds and Realms' in the context of this lesson.
14. How does the philosophical perspective of Epicurus influence modern scientific inquiry into extraterrestrial life?
15. Discuss the interplay between science, philosophy, and theology in understanding the concept of extraterrestrial life, using examples from the lesson.
16. Is the allocation of the US government's \$55 billion budget for space exploration justified? Why or why not? If you believe it is not justified, then describe a more appropriate allocation for this funding.

Unit 6: Lesson 2 - Assessment (Teacher's Edition)

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 - a. The inefficiency of space research

- b. *The prioritization of scientific curiosity and inconspicuous motivations •*
- c. The necessity of space exploration for human survival
- d. The role of political influence in scientific endeavors

Section 3: Short Answer - Write a well-formulated response for each of the following.

13. Describe the concept of 'Multiplicity of Worlds and Realms' in the context of this lesson. • *This concept refers to the idea that there are multiple worlds and realms in the universe, as suggested by certain religious and scientific perspectives. It acknowledges the vastness of the universe and the possibility of various forms of life and environments beyond Earth.*
14. How does the philosophical perspective of Epicurus influence modern scientific inquiry into extraterrestrial life? • *Epicurus' philosophy, which emphasizes materialism and the pursuit of happiness free from fear, including the fear of death, influences some modern scientists. This worldview can drive a curiosity to explore the universe, seeking evidence of diverse forms of life to understand humanity's place and refute notions of human exceptionalism.*
15. Discuss the interplay between science, philosophy, and theology in understanding the concept of extraterrestrial life, using examples from the lesson. • *Students should provide an in-depth analysis of how different disciplines contribute to our understanding of extraterrestrial life. They should mention the scientific approach of astrobiology, the philosophical perspectives of Aristotle and Epicurus, and the theological viewpoints, especially from Islamic theology, about human exceptionalism and the Prophet Muhammad's ﷺ role in the universe.*
16. Is the allocation of the US government's \$55 billion budget for space exploration justified? Why or why not? If you believe it is not justified, then describe a more appropriate allocation for this funding. • *Answers are personal opinions so they will vary, but the justification should be reasonable with supporting evidence.*

Epistemic Framework

Excercise & Application

**Knowledge Café and Harvest:
An Application Tool**

Summary Project Presentation Slide Deck

Lecture Video (Seminar 7)

Epistemic Framework

Assignment/Assessment:

**A Guided Thinking Exercise on the
Religion and Science: Units 1-6**

Activity - Epistemic Framework Worksheet

Epistemic Framework Assignment for Units

1-6:

Knowledge Café and Harvest - What did we learn?

A Guided Thinking Exercise on the Religion and Science Units

Time Length: Varies based on the application method chosen



CCSS Instructional Outcomes

Common Core State Standards

INSTRUCTIONAL OUTCOMES:

Next Generation Science Standards

Science and Engineering Practices: The activity of evaluating evidence (Empirical, Rational, Revelatory) and constructing explanations (e.g., resolving conflicts between claims) aligns with NGSS practices like "Engaging in Argument from Evidence" and "Constructing Explanations and Designing Solutions".

Common Core Standards

CCSS.ELA-Literacy.RI.9-10.1 & RI.11-12.1: These standards involve citing strong and thorough textual evidence to support analysis of what the text says explicitly as well as inferences drawn from the text, which is relevant to analyzing and discussing the Islamic and scientific narratives.

CCSS.ELA-Literacy.SL.9-10.1 & SL.11-12.1: Focusing on comprehension and collaboration, these standards are about initiating and participating effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners.

CCSS.ELA-Literacy.W.9-10.1 & W.11-12.1: These writing standards focus on writing arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

Content Learning Outcomes:

Apply epistemic concepts to revisit key ideas presented in all previous units/lessons.

Focus on the reasoning/thinking process with a guided line of questioning.

Materials:

- Presentation Slides
- Epistemic Framework Worksheet - Student Version
- Epistemic Framework Worksheet - Instructor Version

Instruction/Teacher Facilitation:

Begin by reviewing the 5 Big Questions that were the driving inquiry behind the course study. For each one, ask students to recall what was covered in the lessons to answer these questions.

5 Big Questions about the Human Being

1. What is the origin of humankind? - We covered the Islamic narrative of creation vs Evolution.
2. What is the human's essential nature? - Islamic view of the soul and consciousness vs. Neuroscience reductionism, Physicalism, and AI.
3. What is the human's future? - Islamic view of the purpose of human beings and treatment vs transhumanism and human enhancement.
4. Are human actions predetermined? - Islamic view of Qada/Qadar and genetic determinism.
5. Are humans unique in the universe? - Islamic view of human exceptionalism, particularly with the Prophet ﷺ and extra-terrestrial life; examining a case study to get a glimpse of hadith study via the topic of ETI.

Go over the interrelatedness of each unit to all other units, allowing students to see the correlation between the units visibly. [Use the graphic organizer below, which is present in the slides as well.]

- A knowledge cafe is where students will be discussing the knowledge shared in this course.
- Then we will harvest the knowledge that was disseminated, guided by the epistemological framework of this course, via this summarizing worksheet. This will then be discussed as a whole group so that learning points can be made clear to all students.
- This setup allows students to understand take-home points clearly, communicate that learning, and express their newfound insights

Epistemic Framework Worksheet Activity: A knowledge cafe and harvest (Print out a copy for each student and pass it out to them before giving instructions.)

Epistemic Framework Worksheet - Student Version

Instructions - Each Unit has 3 claims/propositions that are made.

- Determine the source or the evidence of each claim. [Empirical, Rational, or Revelatory]
- Specify what level of certainty that evidence is. [*Qati or Zanni*]
- State if there is any conflict between the 3 claims:
If there is a conflict between the Islamic claim vs the scientific claim, state what that conflict is and explain what would resolve this conflict (if it can be resolved). OR
Do they overlap (i.e. there is no conflict)

Epistemic Framework Worksheet - Teacher Version - completed worksheet

Varied Applications Methods:

Use of this worksheet can be done in multiple ways. Based on students' needs and class structure, the teacher can decide what application works best and will be most effective.

- The Worksheet can be used as a summary at the end of each unit, as a review for that unit. Therefore, each corresponding section is filled out at the end of each unit. [10-15 min.] (Ideal for classroom instruction.)
Students are divided into groups and work on filling out the Worksheet by consensus of the group (discussing and working out any disagreements).
Groups then share with the whole class what their consensus was. The teacher will correct or reconcile any discrepancies in answers and answer any remaining questions.
This process would be repeated at the end of each consecutive unit.
Students would need to keep this worksheet until the end of the course, add to it after each unit is covered, and turn it in after being fully completed.
- The Worksheet can be used as a summary activity at the end of the course after all units are completed. This would help students recall what they learned in all units and serve as an overall summary,

reviewing each unit's material and significant learning points. [40-50 min.]

Students are divided into groups and work on filling out the Worksheet by consensus of the group (discussing and working out any disagreements).

Groups then share with the whole class what their consensus was.

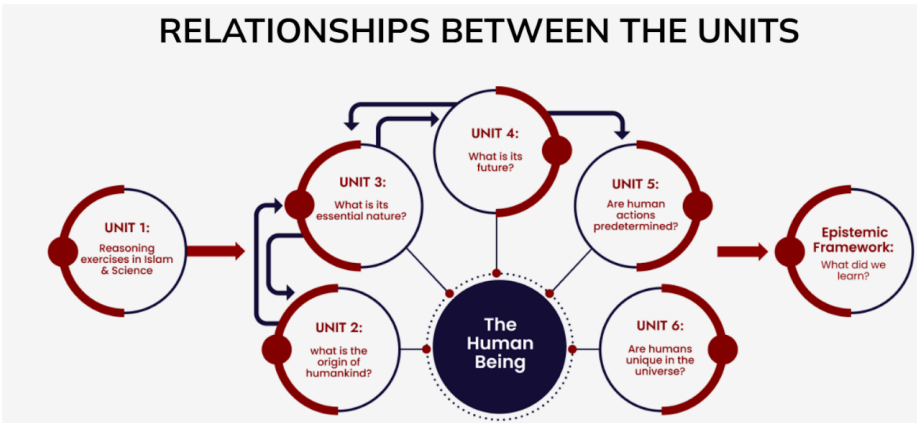
The teacher will correct or reconcile any discrepancies in answers and answer any remaining questions.

- The Worksheet can be used as an assessment, either in class or take-home, or a homework assignment. [45 min - 1 hr. (divided)]

Students individually complete the worksheet and turn it in.

During the following class session, divide students into groups and discuss their answers. (Try to group students who have different answers so that those differences can be discussed and worked through until a consensus is reached.)

As a class, go over the Worksheet. The teacher will correct or reconcile any discrepancies in answers and answer any remaining questions.



Topic	Proposition/Judgment (Specific Truth Claims)	Evidence for the claim (type of judgment)	Level of evidence/ certainty	Is there overlap/conflict?	Ways to resolve
Unit 2: Human evolution and God's special creation. Big Question: What is the origin of human beings?	All biological life, including the human being, is connected to each other in terms of their origin through a lineage and common ancestry.				
	The father of humankind, Adam, was a special creation of God and not a product of evolution.				
	There were 'pre-human' beings on Earth before Adam (as)				
Unit 3: What does it mean to be Human? Neuroscience, Artificial Intelligence, and Human Nature. Big Question: What is the nature of human beings?	We can know the existence of the soul through self-introspection.				
	The world only consists of physical objects and things that can be measured.				
	Consciousness can be simulated by artificial intelligence				
Unit 4: Human Enhancement and Transhumanism: Are we changing/ should we change our being? Big question: Are human beings moving towards post /transhumanism?	Human bodies are changing over time as a result of natural processes				
	Human Immortality is achievable				
	Biomedicine induces changes in our being				
Unit 5: Are We Programmed or Do We Have Free Will? Discussions on Fate and Genetic Determinism Big Question: To what extent are human beings' actions fated?	Some aspects of human life, such as genetic composition and date of birth, are pre-determined				
	Free choice is granted with the faculty of intellect (ikhtyar)				
	Certain genes are associated with crime behaviors and same-sex behaviors				
Unit 6: How do Science and Theology inquire about extra-terrestrial intelligent life and human exceptionalism? Big question: Are human beings unique in the universe?	Extra-terrestrial intelligent exists				
	Existence of ETI challenges the notion of human uniqueness				
	There is multiplicity of worlds and realms				

Topic	Proposition/Judgment (Specific Truth Claims)	Evidence for the claim (type of judgment)	Level of evidence/ certainty	Is there overlap/conflict?	Ways to resolve
Unit 2: Human evolution and God's special creation. Big Question: What is the origin of human beings?	1. All biological life, including the human being, is connected to each other in terms of their origin through lineage and common ancestry.	Empirical +/- Rational	Zanni	-Propositions 1 and 2 conflict -Propositions 2 and 3 conflict	Epistemic register; -Difference among specialists in interpreting the evidence from empirical;
	2. The father of humankind, Adam, was a special creation of God and not a product of evolution.	Revelatory	Qat'i		
	3. There were 'pre-human' beings on Earth before Adam (as)	Empirical;	Zanni		
Unit 3: What does it mean to be Human? Neuroscience, Artificial Intelligence, and Human Nature. Big Question: What is the nature of human beings?	1. We can know the existence of the soul through self-introspection.	Rational	Qat'i	-if word was replicated then it would be conflicted may not be -#2 is conflicted with theology	May not be resolved
	2. The world only consists of physical objects and things that can be measured.	Empirical	Zanni		
	3. Consciousness can be simulated by artificial intelligence	Empirical	Zanni		
Unit 4: Human Enhancement and Transhumanism: Are we changing/ should we change our being? Big question: Are human beings moving towards post /transhumanism?	1. Human bodies are changing over time as a result of natural processes	Empirical	Qat'i	-Overlap in #2 (domain of existence)	
	2. Human Immortality is achievable	Empirical; Revelatory	Zanni, Qat'i		
	3. Biomedicine induces changes in our being	empirical	Qat'i (if bodies); soul (zanni)		
Unit 5: Are We Programmed or Do We Have Free Will? Discussions on Fate and Genetic Determinism Big Question: To what extent are human beings' actions fated?	Some aspects of human life, such as genetic composition and date of birth, are pre-determined	revelatory	qat'i	-Conflict with 2 and 3	-Epistemic register
	Free choice is granted with the faculty of intellect (ikhtyar)	Empirical; revelatory	Zanni; qat'i		
	Certain genes are associated with crime behaviors and same-sex behaviors	empirical	qat'i		
Unit 6: How do Science and Theology inquire about extra-terrestrial intelligent life and human exceptionalism? Big question: Are human beings unique in the universe?	Extra-terrestrial intelligent life exists	Revelatory; empirical	Zanni (angels and jinn: qat'i)	Overlap (#3 and 1)	
	Existence of ETI challenges the notion of human uniqueness	Empirical; revelatory	Zanni		
	There is multiplicity of worlds and realms	Empirical and revelatory	Zanni; qat'i		

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