

Unit 6: Are Human Beings Unique in this Universe?

Science and Theological Inquiry about Extraterrestrial Intelligent Life

Lesson 1 - Do Extraterrestrial Beings Exist?

Time Length: 45-50 min.

INSTRUCTIONAL OUTCOMES:

Next Generation Science Standards (NGSS)

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.

Common Core State Standards (CCSS)

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 fits 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 informs 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 Hadith 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’s actually 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 actually 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 that then scientists can or would be interested in looking into 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’s 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. (*Terrestrial* would be earth-bound)

- 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}

- 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. Be able to 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 really caught your attention?

{SLIDE 9}

- ❖ Scientific endeavors and statistical analysis 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 happened or didn't 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 - how it applies here - 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. Another type of evolution would be more subtle, where one has acclimated to weather conditions and therefore one's tolerance to different weather conditions would be decreased. For example, a person who is used to living in a hot region goes to a cold region and it seems colder to that person than others who have lived in that cold region and are acclimated to that cold weather.
 - 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 the 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 (“dunya-bound” i.e. bound by the parameters of this world).
 - 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 (either punishment or reward associated with it).
 - 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.
 - Ex: removal of alcohol from society - benefits Muslims (a haram is eliminated) therefore benefitting the Muslims in this world as well as the hereafter (because they were 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 benefits 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’s possible,” “the probability is low/high” etc.
 - 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.
 - Zanni is probabilistic knowledge
 - Qat’i 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 are a lot of knowledge and knowledge types that need to be looked at and looked through to determine 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 “earths” with intelligent life? If so, what is the nature of these proofs? - Note that “terrestrial” means earthly terrain or earth.
 - Empirical (‘Adi) Evidence - says that it is possible (not a certainty)
 - Rational (‘Aqli) Evidence - says that it is possible
 - Revelatory (Shar’i) Evidence - We haven’t explored this yet, so let’s see what revelation says.

{SLIDE 15}

- Revelation Exploration - Muslim scholars, and Muhaditheen in particular, do what physicists do or 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 Quran. The source of revelation/wahy 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 Quran you look, the more meanings we can extract.

{SLIDE 16}

- Searching in the Quran, we find this verse:
 - **اللَّهُ الَّذِي خَلَقَ سَبْعَ سَمَاوَاتٍ وَمِنَ الْأَرْضِ مِثْلَهُنَّ يَتَنَزَّلُ 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. (Surah At-Talaaq 65: Ayah 12)
 - In this Ayah, 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.
 - ❖ This latter interpretation is preferred due to corroboration from hadith 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 Hadith.]
 - This Hadith 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 Hadith for ETI
 - When Ibn Abbas R was asked about this very verse in Surah Talaq, this is what he commented on the verse (Q 65:12), stating: "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 Nūḥ like your Nūḥ, an Ibrāhīm like your Ibrāhīm, and an 'Īsā like your 'Īsā."
 - So Ibn 'Abbas (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 hadith, we should verify its authenticity first.
 - It is incumbent that whenever someone claims a report, especially attributing it to the Prophet S, we have to verify it.

{SLIDE 19}

❖ Hadith Critical Methodology - Chain Analysis

- Who is saying this Hadith? The Prophet S is not stating this, a Sahabi, Ibn Abbas R is stating it. Ibn Abbas is one of the top/best Mufasssirs of the Quran, known to be the most knowledgeable about the Quranic Tafseer.
 - We have to look at where this statement/report is traced back to Ibn Abbas R.

{SLIDE 20}

- Sourcing the Report - We trace it back and find this mentioned in 4 sources
 - Sources:

- Tafsīr Ibn Abī Ḥātim, Ibn Abī Ḥātim (an early Muhaddith)
- Tafsīr al-Ṭabarī, Ibn Jarīr al-Ṭabarī, 23:27 (Mufasssīr 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, hadiths 3869, 3869
- al-Asmā' wa-l-Ṣifāt, al-Bayhaqī, hadiths 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 hadith is halted at the Sahabi, it didn't go all the way to the Prophet ﷺ)
 - How certain is it that they said it?
 - Conclusively-Established Reports: Mutawātir (many Sahabis corroborate the report) and they would be considered to be as authentic as Ayaat of the Quran. vs
 - Probabilistic-Established Reports: Khabr Wāḥid (only one Sahabi has reported it)
 - Compared to another Hadith chain that has about 8 narrators, Sahabis, narrating from the Prophet ﷺ and then proliferated on, for example, which is more typical.
 - Comparing with another hadith chain to show how chains proliferate.
 - Problem with a hadith not proliferating early on.
 - This particular report is atypical because there is only one Sahabi at the top of the chain, and then only one narrator from him; no one corroborates Abū al-Ḍuḥā (Madar of the Hadith). [Called a Singularity - only one narrator of the hadith.] (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 Abbas R is one of the greatest Tafseer scholars, even though Ibn Abbas R was the sole Sahabi 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 Abbas 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 Hadith
- Narrator Analysis:
 1. Integrity (ʿadāla)
 2. Accuracy (ḍabt)
 - Chain Analysis:
 3. Uninterrupted chain (ittiṣāl)

- Additional Measures:
 4. Absence of isolated discrepancy (shudhūdh)
 5. Absence of subtle defects (‘ilal)

{SLIDE 24}

- Conclusive (Qat’ī) vs. Probabilistic (Ẓannī)
 - Qat’ī (Conclusive): a text that can bear only one meaning
 - Ẓannī (Probabilistic): a text that can bear more than one meaning
 - Even the Ayah of other earths is zanni, because there were multiple interpretations of the ayah.

{SLIDE 25}

- Establishment (Thubūt) (of the Revelatory Source) vs. Meaning (Dalāla) [Chart]
 - 1. Establishment (Thubūt) - Conclusive (the entire Quran and Mutawaatir Ahadith would be conclusive) & Meaning (Dalāla) - Conclusive
 - 2. Establishment (Thubūt) - Conclusive & Meaning (Dalāla) - Probabilistic
 - 3. Establishment (Thubūt) - Probabilistic (Hadith lower than Sahih in grade, Khabr Wahid) & Meaning (Dalāla) - Conclusive
 - 4. Establishment (Thubūt) - Probabilistic & Meaning (Dalāla) - Probabilistic
 - The Ayah of the multiple earths would be Conclusive in establishment because it is an ayah of the Quran
 - The Ahadith 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:

	Revelatory Evidence	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 thubut and dalala.

{SLIDE 29}

The evidences that we have looked at here, the Hadith and the ayah 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 Hadith - 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 (shahada). (Perhaps we can not 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’ Ibrahim, 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. 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 (qat'i) evidence is not necessarily needed.
 - If a foundational question of belief is being addressed, then conclusive (qat'i) evidence would be needed.
 - Ex: Finality of Prophethood - an essential element of belief
 - For probabilistic topics, the importance of the question is dependent on its weight in the hereafter (aakhirah implications). This then determines the level of importance of answering that question.
 - Ex: Question of organ donation - aakhirah will be affected vs.
 - Ex: Question of whether or not different planets exist - aakhirah not affected