



Unit 5: Lesson 2 - Assessment [Teacher's Edition]

What Does Science Tell Us About Free Will & Determinism

Section 1: True or False - Indicate whether each of the following statements are 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 traits 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 traits.
 - b. DNA similarity has no impact on physical or behavioral traits.
 - 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:
- Only a part of the human genome is effective in determining traits.
 - Human traits and behaviors are influenced by both genetics and environment.
 - Genetic factors are less significant than environmental factors.
 - Human behavior can be predicted with complete accuracy based on genes.
10. CRISPR technology is significant in the study of genetic determinism because it:
- Proves that behavior is not influenced by genes.
 - Allows for the editing of genes, which can alter traits and behaviors.
 - Demonstrates that environmental factors are irrelevant.
 - Confirms that all human traits are predetermined at birth.
11. Which of the following best describes the relationship between genes and behavior according to current scientific understanding?
- Genes have no influence on human behavior.
 - Behavior is determined solely by environmental factors.
 - Genes and behavior have a complex, multifactorial relationship.
 - All human behaviors can be traced back to specific genes.
12. The concept of full genetic determinism is analogous to:
- A choose-your-own-adventure book.
 - A puppet being controlled by a puppeteer.
 - A collaborative team project.
 - 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 doesn't 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 traits 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 benefits and risks of such technologies in influencing human genetics and the concept of free will.