

HiSet Science Practice Test (Sample)

Study Guide



Everything you need from our exam experts!

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Questions

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- 1. What is created as a result of conducting experiments and analyzing data?**
 - A. Theory**
 - B. Data**
 - C. Result**
 - D. Conclusion**
- 2. What is the process of interpreting new experiences in terms of existing schemas called?**
 - A. Accommodation**
 - B. Assimilation**
 - C. Generalization**
 - D. Equilibration**
- 3. What classification can describe jellyfish?**
 - A. Crustacean**
 - B. Coelenterate**
 - C. Cephalopod**
 - D. Arthropod**
- 4. What are the building blocks of proteins called?**
 - A. Amino Acids**
 - B. Fatty Acids**
 - C. Sugars**
 - D. Nucleotides**
- 5. What type of cells make up animals and lack a cell wall, central vacuole, and chloroplasts?**
 - A. Plant Cells**
 - B. Bacterial Cells**
 - C. Animal Cells**
 - D. Fungal Cells**

- 6. In which phase of mitosis do the chromosomes separate and move to opposite ends of the cell?**
- A. Prophase**
 - B. Metaphase**
 - C. Anaphase**
 - D. Telophase**
- 7. What structure carries impulses away from the cell body?**
- A. Dendrites**
 - B. Axons**
 - C. Soma**
 - D. Synapse**
- 8. What is the name of the tube-shaped organs through which most nutrients and water are absorbed from food?**
- A. Stomach**
 - B. Intestines**
 - C. Esophagus**
 - D. Páncreas**
- 9. Which process describes the gradual change in species over generations?**
- A. Natural Selection**
 - B. Genetic Mutation**
 - C. Ecosystem Succession**
 - D. Speciation**
- 10. What are sex cells also known as?**
- A. Somatic Cells**
 - B. Gametes**
 - C. Diploid Cells**
 - D. Stem Cells**

Answers

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1. C
2. B
3. B
4. A
5. C
6. C
7. B
8. B
9. A
10. B

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Explanations

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1. What is created as a result of conducting experiments and analyzing data?

A. Theory

B. Data

C. Result

D. Conclusion

The process of conducting experiments and analyzing data leads to the formation of a conclusion. A conclusion is drawn based on the evidence and findings gathered during the experiment. It reflects an interpretation of the results and provides insights about the hypothesis being tested. While data is indeed collected during experiments, and results are generated as part of the study, it's the conclusion that encapsulates the meaning of the results in light of the initial questions posed or hypotheses made. A conclusion connects the outcome of the experiment to broader scientific understanding, making it a critical part of the scientific method. In summary, after researchers analyze the data, they synthesize their observations and findings into a conclusion, which explains what the results signify in the context of the experiment.

2. What is the process of interpreting new experiences in terms of existing schemas called?

A. Accommodation

B. Assimilation

C. Generalization

D. Equilibration

The process of interpreting new experiences in terms of existing schemas is known as assimilation. In cognitive development, assimilation involves integrating new information into pre-existing frameworks or mental structures, which helps individuals make sense of the world around them. For instance, if a child has a schema for dogs that includes the idea that they are four-legged, furry animals, and they encounter a new breed of dog they haven't seen before, they will fit this new information into their existing dog schema rather than creating an entirely new schema for it. This allows for easier understanding and helps to build on what they already know. In contrast, accommodation refers to the modification of existing schemas or the creation of entirely new ones when new information cannot be integrated into existing schemas, which is a different process. Generalization involves applying learned information to new but similar situations rather than simply interpreting it within the confines of existing knowledge. Equilibration is a process that describes balancing assimilation and accommodation to achieve cognitive stability, but it is not specifically about interpreting new experiences. Hence, assimilation accurately captures the concept of incorporating new experiences based on existing knowledge.

3. What classification can describe jellyfish?

- A. Crustacean
- B. Coelenterate**
- C. Cephalopod
- D. Arthropod

Jellyfish are classified as coelenterates, which are part of the phylum Cnidaria. This classification encompasses not only jellyfish but also other creatures like sea anemones and corals. Coelenterates are characterized by their radial symmetry, a simple body structure with a single opening that serves as both a mouth and an anus, and the presence of specialized cells called cnidocytes that contain stinging structures used for defense and capturing prey. Understanding this classification helps in recognizing the distinct biological traits and ecological roles that jellyfish, as coelenterates, play in marine environments. They differ significantly from the other classifications mentioned, which include crustaceans (which are part of the phylum Arthropoda), cephalopods (like octopuses and squids, also within Mollusca), and arthropods. Each of these phyla has unique characteristics that set them apart from coelenterates.

4. What are the building blocks of proteins called?

- A. Amino Acids**
- B. Fatty Acids
- C. Sugars
- D. Nucleotides

Amino acids are the fundamental units that compose proteins, serving as their building blocks. Each protein is made up of a specific sequence of amino acids, which determines the protein's structure and function. There are 20 different amino acids that can be combined in various ways to create a vast array of proteins, reflecting the diversity of roles proteins play in biological systems, including catalyzing reactions (as enzymes), providing structural support, and facilitating transport within cells. Understanding protein structure begins with comprehending how amino acids link together through peptide bonds, forming polypeptides that eventually fold into functional three-dimensional shapes. This detailed knowledge of amino acids is essential for grasping topics in biochemistry, molecular biology, and genetics. Other options listed, such as fatty acids, sugars, and nucleotides, refer to different types of biological molecules, each with distinct roles that do not involve the direct building of proteins.

5. What type of cells make up animals and lack a cell wall, central vacuole, and chloroplasts?

A. Plant Cells

B. Bacterial Cells

C. Animal Cells

D. Fungal Cells

Animal cells are the correct answer because they are characterized by the absence of a cell wall, which distinguishes them from plant, bacterial, and fungal cells. Instead of a rigid cell wall, animal cells possess a flexible plasma membrane that allows them to adopt various shapes and enhance their mobility. Additionally, animal cells do not contain a central vacuole, which is typically found in plant cells and serves functions such as storage and maintaining turgor pressure. Instead of relying on a central vacuole, animal cells have smaller vacuoles that serve different, often temporary roles. Chloroplasts are the organelles responsible for photosynthesis, found primarily in plant cells and some protists, but absent in animal cells. As a result, animal cells rely on consuming organic compounds for energy and do not have the capability to convert sunlight into energy as plant cells do. In summary, the defining features of animal cells—specifically, the lack of cell walls, central vacuoles, and chloroplasts—make them distinct from other types of cells listed in the question.

6. In which phase of mitosis do the chromosomes separate and move to opposite ends of the cell?

A. Prophase

B. Metaphase

C. Anaphase

D. Telophase

During mitosis, the phase in which the chromosomes separate and move to opposite ends of the cell is called anaphase. In this stage, the sister chromatids, which are the duplicated chromosomes, are pulled apart by the spindle fibers attached to their centromeres. This action ensures that each new daughter cell will receive an identical set of chromosomes. As anaphase progresses, the chromatids move toward the poles of the cell, driven by the contraction of the spindle fibers. This separation is crucial for ensuring genetic stability in the resulting daughter cells. Once the chromatids reach the poles, the cell prepares for the next phase, telophase, where the cell begins to divide. Understanding the correct sequence of stages in mitosis is important, as each phase plays a specific role in cell division and the maintenance of genetic information.

7. What structure carries impulses away from the cell body?

A. Dendrites

B. Axons

C. Soma

D. Synapse

The structure that carries impulses away from the cell body is the axon. Axons are long, slender projections of a nerve cell that transmit electrical signals, known as action potentials, away from the soma (cell body) towards other neurons, muscles, or glands. The function of axons is crucial for the communication between different parts of the nervous system and the body. While dendrites carry impulses toward the cell body, and the soma is the main body of the neuron that processes information, the axon is specifically designed to convey information away from the soma to ensure that signals can be sent efficiently over distances. The synapse, on the other hand, is the junction between two neurons through which impulses are transmitted, but it does not carry impulses itself. Thus, axons play an essential role in the overall functioning of the nervous system by facilitating the flow of information away from the neuron's cell body.

8. What is the name of the tube-shaped organs through which most nutrients and water are absorbed from food?

A. Stomach

B. Intestines

C. Esophagus

D. Páncreas

The correct answer identifies the intestines as the tube-shaped organs primarily responsible for the absorption of most nutrients and water from food. The intestines consist of two main sections: the small intestine and the large intestine. The small intestine is particularly vital for nutrient absorption, as it has many folds and finger-like projections called villi that significantly increase its surface area, enabling efficient nutrient uptake. Water absorption mainly occurs in the large intestine, which further processes waste before elimination. Therefore, the intestines play a crucial role in digestion and nutrient absorption, making this the accurate response to the question.

9. Which process describes the gradual change in species over generations?

- A. Natural Selection**
- B. Genetic Mutation**
- C. Ecosystem Succession**
- D. Speciation**

The process that describes the gradual change in species over generations is natural selection. Natural selection is a key mechanism of evolution, where individuals with traits that are better suited to their environment tend to survive and reproduce, passing those advantageous traits on to their offspring. Over time, this leads to a gradual shift in the characteristics of a species, as advantageous traits become more common within the population and less favorable traits diminish. In this context, it's important to differentiate natural selection from other processes. Genetic mutation refers to random changes in an organism's DNA, which can introduce new traits but doesn't inherently lead to gradual changes in species without the influence of selection pressures. Ecosystem succession is the process of change in the species structure of an ecological community over time, but it focuses more on community dynamics than on changes within a single species. Speciation, meanwhile, is the process through which new species arise; while it may result from natural selection over time, it specifically describes the formation of distinct species rather than the gradual change within a single species.

10. What are sex cells also known as?

- A. Somatic Cells**
- B. Gametes**
- C. Diploid Cells**
- D. Stem Cells**

Sex cells are known as gametes. These are specialized cells that are involved in reproduction. In humans and many other organisms, there are two types of gametes: sperm, which are produced by males, and eggs (or ova), which are produced by females. Gametes carry half the number of chromosomes found in somatic cells, which are the body's non-reproductive cells. When a sperm and an egg unite during fertilization, they form a zygote with a complete set of chromosomes, restoring the diploid number. Understanding that gametes are distinct from other cell types is crucial. Somatic cells refer to all body cells except for the reproductive cells, while diploid cells contain two sets of chromosomes and typically refer to somatic cells. Stem cells are unique in their ability to differentiate into various cells in the body and are not specifically linked to reproduction like gametes are. Therefore, the term gametes is specifically applicable to sex cells in the context of reproduction.