Praxis Elementary Education: Science (5005) Practice Test (Sample)

Study Guide

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Questions

1. Atoms with a neutral charge have an atomic number that is equal to what?

A. The number of protons

B. The number of neutrons

C. The number of electrons

D. Half the number of protons

2. What causes friction in motion?

A. Gravity acting on an object

B. Resistance from surface contact

C. Internal temperature changes

D. The type of material an object is made of

3. Which term refers to the inherited traits that improve an organism's chance of survival?

A. Mutation

B. Adaptation

C. Ecosystem

D. Homostasis

4. Which of the following is NOT a direct result of habitat destruction?

A. Species migration

B. Increased competition

C. Decline in predator populations

D. Improved genetic diversity

5. What is the role of the lithosphere in Earth's structure?

A. It is the innermost layer of the Earth

B. It contains the Earth's water bodies

C. It forms the crust and upper part of the mantle

D. It generates the Earth's magnetic field

6. Which of the following best defines secondary consumers in an ecosystem?

- **A. Carnivores and herbivores**
- **B. Carnivores and omnivores**
- **C. Herbivores and producers**
- **D. Producers and decomposers**

7. What characterizes a renewable resource?

- **A. A resource that cannot be replenished**
- **B. A resource that can be extracted quickly**
- **C. A natural resource that can be replenished naturally over time**
- **D. A resource that is always in limited supply**

8. Who is credited with creating the periodic table of elements?

- **A. Albert Einstein**
- **B. Dmitri Mendeleev**
- **C. Marie Curie**
- **D. Niels Bohr**

9. Which of the following best describes tertiary consumers?

- **A. They eat only plants**
- **B. They eat herbivores only**
- **C. They consume both carnivores and herbivores**
- **D. They are the first link in the food chain**

10. What is the definition of adaptation in biology?

- **A. A learned behavior that aids survival**
- **B. An inherited physical or behavioral trait that enhances survival**
- **C. A temporary response to environmental changes**
- **D. A process of natural selection**

Answers

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

Explanations

1. Atoms with a neutral charge have an atomic number that is equal to what?

A. The number of protons

B. The number of neutrons

C. The number of electrons

D. Half the number of protons

Atoms with a neutral charge have an atomic number that is equal to the number of protons present in the nucleus of the atom. The atomic number is defined as the number of protons. In a neutral atom, the number of electrons is also equal to the number of protons because the charge must balance out; thus, an atom with no overall charge has equal numbers of positive (protons) and negative (electrons) particles. This relationship helps in identifying the element on the periodic table, where each element is defined by its atomic number, which corresponds to the number of protons. If an atom gains or loses electrons, it becomes an ion and will then carry either a positive or negative charge, but a neutral atom remains balanced with an equal number of protons and electrons.

2. What causes friction in motion?

A. Gravity acting on an object

B. Resistance from surface contact

C. Internal temperature changes

D. The type of material an object is made of

Friction in motion is primarily caused by resistance from surface contact between two objects. When two surfaces come into contact, the microscopic roughness and irregularities of those surfaces interact, leading to a resisting force that opposes the motion of one or both objects. This resistance is what we refer to as friction, and it plays a significant role in various everyday experiences, such as walking, driving, and the functioning of machines. When a person walks, for instance, friction between their shoes and the ground allows them to push off and move forward. This resistance is necessary for controlling motion, stopping, and even starting movement. The amount of friction depends on factors such as the texture of the surfaces in contact, the weight of the objects, and whether the surfaces are stationary or sliding against each other. While gravity, internal temperature changes, and materials can influence friction, they do not directly cause it. Gravity affects how much force is pressing the two surfaces together, which in turn can influence the amount of friction, but the actual cause of friction is the surface interaction itself.

3. Which term refers to the inherited traits that improve an organism's chance of survival?

A. Mutation

B. Adaptation

C. Ecosystem

D. Homostasis

The term that refers to the inherited traits that improve an organism's chance of survival is adaptation. Adaptations are characteristics that have evolved over time through the process of natural selection, enabling organisms to better fit their environments. These traits can include physical features, such as the thick fur of animals in cold climates, or behavioral traits, like migration patterns in birds. Successful adaptations enhance an organism's ability to survive and reproduce, passing those advantageous traits on to future generations. In this context, mutations describe random changes in an organism's DNA that can lead to new traits but are not inherently beneficial. An ecosystem refers to a community of living organisms and their environmental interactions, which is not directly tied to individual traits. Homeostasis refers to the mechanisms that maintain stable internal conditions within an organism regardless of external changes, which is generally about regulation rather than inherited traits that enhance survival.

4. Which of the following is NOT a direct result of habitat destruction?

A. Species migration

B. Increased competition

C. Decline in predator populations

D. Improved genetic diversity

Habitat destruction typically leads to various ecological changes that impact species and populations within that ecosystem. Improved genetic diversity is often not a direct result of habitat destruction. In fact, habitat destruction usually reduces the size and connectivity of populations, which can lead to inbreeding and a decrease in genetic diversity. When habitats are destroyed, organisms may be forced to migrate to new areas, leading to species migration. Additionally, as habitats become fragmented, the remaining resources can become over-utilized, resulting in increased competition among species for food, shelter, and mates. The decline in predator populations can occur as their prey may also decline due to habitat loss, disrupting the predator-prey balance. Therefore, it is important to understand that while habitat destruction can lead to numerous ecological and biological changes, improved genetic diversity is not one of them. In fact, it tends to have the opposite effect, decreasing genetic variation within populations.

5. What is the role of the lithosphere in Earth's structure?

A. It is the innermost layer of the Earth

B. It contains the Earth's water bodies

C. It forms the crust and upper part of the mantle

D. It generates the Earth's magnetic field

The lithosphere plays a crucial role in Earth's structure as it constitutes the outer layer of the planet, composed of the crust and the uppermost part of the mantle. This rigid layer is essential for creating the landforms we see on the surface, including mountains, valleys, and plains. The lithosphere's rigidity allows it to support tectonic activity, such as earthquakes and volcanic eruptions, as tectonic plates move and interact at their boundaries. This understanding of the lithosphere highlights its significance in various geological processes and the role it plays in Earth's overall structure. It is the foundation upon which ecosystems thrive and is integral to phenomena related to geology, ecology, and weather conditions. The other options misidentify the lithosphere; for instance, it is not the innermost layer (that would be the inner core), does not contain water bodies (which are part of the hydrosphere), and is not responsible for generating the Earth's magnetic field (that function is attributed mainly to the outer core).

6. Which of the following best defines secondary consumers in an ecosystem?

A. Carnivores and herbivores

B. Carnivores and omnivores

C. Herbivores and producers

D. Producers and decomposers

Secondary consumers are organisms that primarily eat primary consumers, which are typically herbivores. In an ecosystem, these secondary consumers can be carnivores, which eat other animals, or omnivores, which consume both plants and animals. This definition encompasses a broad range of species that play a vital role in the food web by helping to control herbivore populations and facilitate energy transfer within the ecosystem. Carnivores, as secondary consumers, typically feed on the primary consumers (herbivores), while omnivores can consume both primary consumers and producers (plants). This flexibility in diet allows omnivores to occupy multiple niches within the ecosystem, contributing to its stability and resilience. The other options do not accurately reflect the role of secondary consumers. The first choice includes herbivores, which are primary consumers, and therefore does not fit the definition of secondary consumers. The third choice incorrectly includes producers, which are the base of the food chain, and not consumers at all. The last option mentions decomposers, which help recycle nutrients in the ecosystem but do not fall under the category of consumers.

7. What characterizes a renewable resource?

A. A resource that cannot be replenished

B. A resource that can be extracted quickly

C. A natural resource that can be replenished naturally over time

D. A resource that is always in limited supply

A renewable resource is characterized as a natural resource that can be replenished naturally over time. This means that it is capable of being regenerated, allowing for sustainable use without depleting the resource completely. Examples of renewable resources include solar energy, wind energy, and biomass, which can be harnessed repeatedly over time as they naturally regenerate. In contrast, the other options describe different scenarios. A resource that cannot be replenished indeed refers to non-renewable resources, such as fossil fuels, which once consumed are gone and cannot be replaced within a human timescale. A resource that can be extracted quickly may refer to the ease of accessing a resource but does not address its ability to regenerate. Lastly, a resource that is always in limited supply indicates a scarcity, which is characteristic of some non-renewable resources, rather than renewable ones that can replenish themselves. Thus, the defining attribute of a renewable resource is its natural ability to recover and regenerate over time.

8. Who is credited with creating the periodic table of elements?

A. Albert Einstein

B. Dmitri Mendeleev

C. Marie Curie

D. Niels Bohr

Dmitri Mendeleev is recognized for creating the periodic table of elements. His groundbreaking work in the mid-19th century laid the foundation for how we understand the organization of elements. Mendeleev arranged the 63 known elements according to their atomic mass and proposed that elements with similar properties should be grouped together. This organization revealed periodic trends and allowed him to predict the existence and properties of elements that had not yet been discovered, demonstrating the predictive power of his table. His contributions have made a lasting impact on chemistry and continue to be relevant in understanding elemental properties and relationships today.

9. Which of the following best describes tertiary consumers?

A. They eat only plants

B. They eat herbivores only

C. They consume both carnivores and herbivores

D. They are the first link in the food chain

Tertiary consumers are organisms that occupy a higher level in the food chain compared to primary consumers (herbivores) and secondary consumers (carnivores that eat herbivores). By definition, tertiary consumers are usually predators that can consume both secondary consumers (which are typically carnivores) and primary consumers (herbivores). This flexibility in their diet allows them to play a crucial role in maintaining the balance of ecosystems by regulating the populations of both herbivores and smaller carnivores. Their position at the top of the food chain highlights their importance as apex predators within their respective habitats.

10. What is the definition of adaptation in biology?

A. A learned behavior that aids survival

B. An inherited physical or behavioral trait that enhances survival

C. A temporary response to environmental changes

D. A process of natural selection

The definition of adaptation in biology refers to an inherited physical or behavioral trait that enhances an organism's ability to survive and reproduce in its environment. This concept emphasizes that adaptations are passed down from one generation to the next through genetic inheritance. Over time, these traits become more prevalent in a population, leading to evolutionary changes. For example, many animals have developed specific adaptations that allow them to thrive in particular habitats, such as the thick fur of polar bears that insulates them against cold temperatures, or the long necks of giraffes that enable them to reach high leaves for food. These traits have evolved because they provide a survival advantage in specific environments. Other choices provided do not accurately capture the biological concept of adaptation. A learned behavior is not an inherited trait but rather something developed through experience. A temporary response to environmental changes refers more to acclimatization, which does not involve genetic change. The process of natural selection is the mechanism that drives adaptations but does not define what an adaptation itself is. Thus, the correct answer accurately reflects the term's definition in the context of biology.