

Name: \_\_\_\_\_ Date: \_\_\_\_\_

## Outsmart the Greenhouse Effect: A 5th Grade Climate Analysis Quiz

Evaluate the relationship between albedo effect, permafrost thaw, and feedback loops to understand how global systems respond to thermal energy shifts.

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**1. The 'Albedo Effect' describes how different surfaces reflect sunlight. If Arctic sea ice melts and reveals dark ocean water underneath, how does this affect the Earth's temperature?**

- A. The dark water reflects more sunlight, cooling the planet.
- B. The dark water absorbs more heat, accelerating global warming.
- C. The water acts as an insulator, keeping the heat trapped deep underwater.
- D. There is no change because water and ice reflect light the same way.

**2. When permafrost in the Arctic tundras thaws due to rising temperatures, it releases \_\_\_\_\_, a potent greenhouse gas that was trapped in the frozen soil.**

- A. Oxygen
- B. Nitrogen
- C. Methane
- D. Argon

**3. True or False: Planting 'urban forests' in cities is an adaptation strategy designed to reduce the 'Heat Island Effect' caused by concrete and asphalt.**

- A. True
- B. False

**4. If a coastal community builds 'living shorelines' using oyster reefs and marsh grasses instead of concrete walls, which objective are they primarily meeting?**

- A. Eliminating the need for all fossil fuels immediately.
- B. Creating a natural barrier that adapts to rising sea levels.
- C. Preventing the Sun from reaching the ocean floor.
- D. Increasing the salt content of the local drinking water.

**5. Scientists study ancient climate data by drilling long cylinders of ice out of glaciers. These are known as \_\_\_\_\_.**

- A. Frost Tubes
- B. Glacier Sticks
- C. Ice Cores
- D. Snow Samples

**6. Which of these represents a 'Mitigation' strategy rather than an 'Adaptation' strategy?**

- A. Moving a coastal town to higher ground.
- B. Developing heat-tolerant varieties of corn.

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- C. Switching a city's bus fleet from diesel to green hydrogen.
- D. Building larger drainage pipes for extreme rain events.

**7. True or False: The Greenhouse Effect is a completely man-made phenomenon that did not exist before the Industrial Revolution.**

- A. True
- B. False

**8. Ocean \_\_\_\_\_ happens when the sea absorbs excess CO<sub>2</sub>, which lowers the pH of the water and makes it harder for shellfish to grow shells.**

- A. Acidification
- B. Evaporation
- C. Carbonation
- D. Oxygenation

**9. How does the loss of mountain glaciers impact human populations living in valleys below?**

- A. It increases the amount of available gold in riverbeds.
- B. It leads to a permanent decrease in reliable freshwater for farming.
- C. It makes the air in the valleys much thinner and harder to breathe.
- D. It has no impact since people don't live on the glaciers.

**10. True or False: Re-introducing apex predators like wolves to an ecosystem can be a form of 'Nature-Based Climate Solution' because it can help restore forests that store carbon.**

- A. True
- B. False