

Name: _____ Date: _____

Answer Key: Glacial Ghost Hunt: A 6th Grade Climate Feedback Quiz

Evaluate how albedo shifts and permafrost thaw accelerate global warming through complex feedback loops in this advanced analytical assessment.

1. In the Arctic, as white sea ice melts, it reveals dark ocean water. This dark water absorbs more heat, causing more ice to melt. What scientific concept best describes this self-reinforcing cycle?

Answer: B) A positive feedback loop

Positive feedback loops occur when the product of a reaction leads to an increase in that reaction. In this case, warming leads to more warming.

2. Scientists measure the ability of a surface to reflect solar radiation using the term ____; ice has a high value, while asphalt has a low value.

Answer: C) Albedo

Albedo is the measure of reflectivity of a surface. Higher albedo means more sunlight is reflected back into space, cooling the Earth.

3. Thawing permafrost in the Tundra is considered a 'carbon sink' because it traps methane underground forever as the temperature rises.

Answer: B) False

Thawing permafrost is actually a carbon source; as it melts, it releases stored methane and CO₂, which are potent greenhouse gases.

4. Which of these is a significant 'hidden' source of methane that results from agricultural practices rather than just fossil fuel combustion?

Answer: B) Rice paddy cultivation

Flooded rice paddies create anaerobic conditions where bacteria produce methane, a greenhouse gas many times more powerful than CO₂.

5. The 'Greenhouse Effect' is essential for life, but human-enhanced levels of ____ are causing the atmosphere to retain too much thermal energy.

Answer: D) Greenhouse gases

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While the effect is natural, the increase in gases like CO₂ and methane traps more infrared heat, raising global temperatures.

6. If a coastal city builds a floating 'sponge district' that allows water to flow through parks during floods instead of destroying buildings, this is an example of:

Answer: C) Climate Adaptation

Adaptation involves changing our infrastructure and behaviors to live with the unavoidable impacts of climate change.

7. The 'Industrial Revolution' marks a significant turning point in Earth's climate history because it began the era of mass fossil fuel consumption.

Answer: A) True

Historical data shows a sharp increase in atmospheric CO₂ concentrations beginning in the mid-1700s with the rise of coal-powered industry.

8. When CO₂ dissolves into the ocean, it reacts with water to form carbonic acid, a process known as Ocean ____, which weakens the shells of shellfish.

Answer: B) Acidification

Ocean acidification lowers the pH of the water, making it difficult for organisms like oysters and coral to build their calcium carbonate structures.

9. Which strategy describes 'Mitigation' rather than 'Adaptation'?

Answer: C) Mandating that all city buses run on electricity

Mitigation focuses on the root cause of climate change by reducing the amount of greenhouse gases we release into the atmosphere.

10. Global warming and Climate Change are the exact same thing; 'Global Warming' refers to the increasing intensity of rain and snowstorms.

Answer: B) False

Global warming refers specifically to the rise in Earth's average temperature, while Climate Change is the broader set of changes (rain, wind, heat) that result from it.