

Name: _____ Date: _____

Glaciers to Gas Guzzlers: The Climate Change Survival Challenge for 8th Grade

Calculate carbon feedback loops and evaluate the thermodynamic impact of albedo loss while proposing engineering solutions for urban heat islands.

1. Which phenomenon describes the process where melting permafrost releases trapped methane, further accelerating global warming beyond human-driven emissions?

- A. The Greenhouse Effect
- B. Oceanic Acidification
- C. Positive Feedback Loop
- D. Thermal Expansion

2. The 'Albedo Effect' refers to the ability of dark surfaces like the open ocean to reflect more solar radiation back into space than white ice sheets.

- A. True
- B. False

3. As world oceans absorb higher concentrations of CO₂, the chemical reaction produces _____ acid, which lowers the pH of the water and dissolves the shells of mollusks.

- A. Sulfuric
- B. Nitric
- C. Hydrochloric
- D. Carbonic

4. Scientists use 'proxy data' to understand climates from thousands of years ago. Which of the following is an example of a climate proxy used to measure ancient atmospheric composition?

- A. Satellite imagery
- B. Air bubbles trapped in ice cores
- C. Modern weather station logs
- D. Barometric pressure readings

5. The process of 'Carbon _____' involves capturing CO₂ from industrial sources and pumping it deep underground into geological formations for permanent storage.

- A. Sequestration
- B. Combustion
- C. Evaporation
- D. Nitrification

6. Global warming and 'Climate Change' are scientifically identical terms that describe only the increase in the Earth's average surface temperature.

- A. True

Name: _____ Date: _____

B. False

7. Which sector is globally responsible for the highest percentage of greenhouse gas emissions due to its heavy reliance on coal, natural gas, and oil?

- A. Agriculture and Land Use
- B. Electricity and Heat Production
- C. Residential Waste Management
- D. Textile Manufacturing

8. The _____ protocol was an international treaty designed to reduce emissions, though it was later succeeded by the Paris Agreement which aimed to limit warming to below 2 degrees Celsius.

- A. Montreal
- B. Kyoto
- C. Geneva
- D. Antarctic

9. Climate adaptation involves changing our behavior and infrastructure to live with the impacts of climate change, such as building floating houses in flood-prone areas.

- A. True
- B. False

10. If the Thermohaline Circulation (the 'Great Ocean Conveyor Belt') were to slow down due to fresh water melting from Greenland, what would be the likely result for Northern Europe?

- A. A significant increase in tropical storms
- B. A cooling effect due to lack of warm water transport
- C. Increased volcanic activity along the coast
- D. Lower sea levels in the North Sea