

Carbon Cycle and Climate Change

1. Four consequences of global warming are listed below.

	Consequences
1	The permafrost has thawed ✓
2	The number of extreme weather events has increased ✓
3	Sea levels have risen ✓
4	Snow geese have begun making their nests farther north ✓

leads to ↑ in decomposition ∴ more CH₄ + CO₂

Which of these consequences helps increase the greenhouse effect?

- A) Consequence 1 B) Consequence 2 C) Consequence 3 D) Consequence 4
2. Certain gases in the atmosphere absorb some of the heat from earth warmed by sun's rays, which increases the temperature of the Earth. Which of the gases listed below IS NOT related to this phenomenon known as the greenhouse effect?
 A) Carbon dioxide B) Methane C) Oxygen D) Water vapour
3. Which of the following does not contribute to the formation of greenhouse gases?
 A) Decomposition of waste in landfills C) Melting of the permafrost ✓
 B) Burning of fossil fuels ✓ D) Photosynthesis in plants
4. In general, permafrost is ground that...
 A) Is always frozen C) Only freezes during winter
 B) Rarely freezes D) Is located mainly in high altitude
5. Which of the following processes does not cycle carbon dioxide (CO₂) back into the atmosphere?
 A) Photosynthesis *plants use CO₂* C) Forest fires
 B) Decomposition of waste D) Volcanic eruptions
6. Which of the following gases do not contribute to the greenhouse effect?
 A) CO₂ B) N₂O C) CH₄ D) SO₂
7. Five human activities are listed below.
 1. Raising cattle ✓ ↑ CH₄ 2. Driving a gasoline powered car ✓ ↑ CO₂
 3. Using a natural gas fireplace ✓ ↑ CO₂ 4. Walking × 5. Swimming in a lake ×
 Which of the above activities could contribute to the greenhouse effect?
 A) 1 and 2 only B) 1, 2 and 3 C) 2 and 3 only D) 4 and 5
8. Which of the following statements correctly describes permafrost?
 A) All the frozen water on the Earth's surface.
 B) A layer of permanently frozen soil.
 C) The snow which accumulates on the surface of glaciers.
 D) The upper layer of water which freezes when in contact with cold air.

9. Several initiatives have been put in place across Canada to reduce or capture the methane gas, CH₄, released from landfills. Internationally, Canada is working in partnership with Columbia and Mexico on various projects to reduce methane emissions from landfills in these countries. Which of the statements below best explains why Canada is working to reduce methane emissions from landfills?
- A) Methane emissions contribute to the formation of acid rain.
 - B) Methane emissions contribute to the greenhouse effect.**
 - C) Methane emissions cause the corrosion of buildings.
 - D) Methane emissions are the main cause of the depletion of the ozone layer.

10. Which statement is true regarding the greenhouse effect?
- A) Ultraviolet (UV) rays emitted by the sun are dispersed in the atmosphere.
 - B) Some of the infrared rays emitted by the sun are trapped in the atmosphere.**
 - C) Ozone prevents certain types of harmful solar radiation from passing through the atmosphere.
 - D) Ammonia (NH₃) is one of the main gases that keep the heat released by the sun in the atmosphere.

11. What effect will fewer plants and trees have on the environment?
- A) There will a reduction in photosynthesis**
 - B) There will be an equilibrium of gases in the atmosphere
 - C) There will be an increase in animal respiration
 - D) There will be less greenhouse gases in the atmosphere

12. Which of the following statements is true about melting permafrost? Melting permafrost...

- A) contributes to global warming**
- B) increases soil stability *x landslides!*
- C) modifies ocean surface currents *x ← melting ice caps*
- D) prevents vegetation from growing *← more plants will grow if soil is thawed.*

*methane traps more heat * but there is less of it in the atmosphere so CO₂ = worse*

13. Regarding the carbon cycle, what gas is most responsible for the greenhouse effect caused by human activities?

- A) H₂O produced by evaporation
- B) CO₂ produced by combustion**
- C) N₂O produced by various means of transportation
- D) CH₄ produced by herbivores during digestion *decomposers decomposition*

14. Name two changes individuals can make in their daily activities that could help decrease the amount of greenhouse gases in the air.

- ↓ combustion - car pool*
- public transport*
- buy local (↓ transportation)*

15. Carbon dioxide (CO₂) is an important source of carbon for living organisms.

a- Name two processes through which carbon can enter the biosphere?

- photosynthesis*
- formation calcium carbonate (= shells/rocks)*

b- Name 2 processes which remove carbon from the biosphere.

- combustion*
- decomposition*