

1.2 System

1.2.2 Feedback Loop, Tipping Point and Resilience

Activity 1

- Label each example as either positive or negative feedback.
- Choose one example of each (positive and negative) and draw diagrams showing how the feedback loop operates. Be sure to include arrows and loops in your diagrams.

1. Rising atmospheric carbon dioxide

- CO₂ levels increase → Earth's temperature rises → photosynthesis in plants increases → more CO₂ removed from the atmosphere → greenhouse effect reduced → global temperature decreases.
- Type: _____

2. Melting ice and reduced albedo

- Earth warms → ice cover melts → darker surfaces exposed → albedo decreases → more energy absorbed → further warming → more ice melts.
- Type: _____

3. Permafrost melting and methane release

- Earth warms → upper permafrost layers thaw → waterlogged soils form → methane released → stronger greenhouse effect → further warming → more permafrost melts.
- Type: _____

4. Cloud formation from evaporation

- Earth warms → evaporation increases → more clouds form → albedo increases → more solar radiation reflected → Earth cools → evaporation decreases.
- Type: _____

5. Soil decomposition releasing CO₂

- Earth warms → decomposition of organic matter speeds up → more CO₂ released → enhanced greenhouse effect → further warming → faster decomposition.
- Type: _____

6. Snowfall increasing ice cover

- Earth warms → evaporation increases → snowfall rises in polar regions → ice caps grow → albedo increases → more solar radiation reflected → Earth cools → evaporation decreases.
- Type: _____

7. Icebergs disrupting ocean currents

- Earth warms → polar ice melts → icebergs add freshwater to oceans → warm currents (e.g., Gulf Stream) disrupted → less heat transferred to poles → polar regions cool → ice sheets reform → ocean currents re-stabilize.
- Type: _____