

GRADE 8 | 2024

Life and Living: Ecosystems

Natural Sciences

CAPS ALIGNED

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1. Ecosystems

An ecosystem includes all the living organisms in an area AND their non-living environment, all interacting together.

- Biotic factors: living components (plants, animals, bacteria, fungi)
- Abiotic factors: non-living components (water, light, temperature, soil, air)

2. Food Chains and Food Webs

FORMULA: Producer --> Primary Consumer --> Secondary Consumer --> Tertiary Consumer

- Producers: make their own food through photosynthesis (plants, algae)
- Consumers: eat other organisms (herbivores, carnivores, omnivores)
- Decomposers: break down dead organic matter (bacteria, fungi)

KEY POINT: Energy flows in ONE direction through a food chain. A food web shows multiple interconnected food chains.

3. Photosynthesis

FORMULA: $6\text{CO}_2 + 6\text{H}_2\text{O} + \text{light energy} \rightarrow \text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2$
(carbon dioxide + water + light --> glucose + oxygen)

Photosynthesis occurs in the chloroplasts of plant cells. Chlorophyll absorbs light energy.

4. Respiration

FORMULA: $\text{C}_6\text{H}_{12}\text{O}_6 + 6\text{O}_2 \rightarrow 6\text{CO}_2 + 6\text{H}_2\text{O} + \text{energy (ATP)}$
(glucose + oxygen --> carbon dioxide + water + energy)

All living organisms respire to release energy from food. Aerobic respiration requires oxygen.

5. Human Impact on Ecosystems

- Deforestation: destroys habitats, reduces biodiversity
- Pollution: air, water, and soil pollution harm organisms
- Overgrazing: destroys vegetation cover, causes soil erosion
- Climate change: alters temperature and rainfall patterns