

Energy Begins Here

Trace how photosynthesis supports a food web.

LS.4.a "photosynthesis is the foundation of virtually all food webs; and"

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each photosynthetic producer. Circle the food molecule or energy source it uses, then number the organisms in the pond feeding path in the order energy moves.

Sunlight in the Pond

- ① On a sunny pond, green algae drift near the surface. Using energy from sunlight, the algae make sugars from carbon dioxide and water. This process, photosynthesis, stores the sun's energy in food molecules. Tiny animals called zooplankton eat the algae. Small fish eat zooplankton, and a heron may eat the fish. Although the heron does not eat algae, energy that began in algae helps power its flight, growth, and other life processes in the wetland.
- ② Plants on land and algae in water are producers because they can make their own food through photosynthesis. Consumers cannot capture sunlight to make sugars this way. A rabbit gets energy by eating grass, a fox gets energy by eating the rabbit, and fungi gain energy from dead material. Decomposers return matter to the environment, where producers can use some materials again. Energy, however, moves through feeding relationships and is not recycled back to the sun.
- ③ If a disease greatly reduces the algae in the pond, zooplankton have less food. Their population may decrease, leaving less prey for small fish. Herons may then find fewer fish to eat. The change can spread across the food web because many organisms depend directly or indirectly on photosynthetic producers. Photosynthesis does not feed every organism in the same way, but it supplies the chemical energy at the base of most food webs. Some unusual ecosystems use chemical energy instead.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 What two materials do algae use to make sugars, and what is their energy source?

2 Trace the pond feeding path that carries energy from algae to a heron.

3 Why can a heron receive energy from algae even though it does not eat algae?

4 Predict one effect on the pond food web if disease greatly reduces the algae. Use evidence from the passage.

3 YOUR TURN _____ Your own words

Choose a land or water habitat not named in the passage. In the box, create a four-organism food chain that begins with a photosynthetic producer, using arrows to show energy movement. Then write two sentences explaining how photosynthesis supports the chain.

PART 1 • READ AND MARK

Underline each photosynthetic producer. Circle the food molecule or energy source it uses, then number the organisms in the pond feeding path in the order energy moves. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	What two materials do algae use to make sugars, and what is their energy source?	Algae use carbon dioxide and water, with energy from sunlight.
2	Trace the pond feeding path that carries energy from algae to a heron.	algae → zooplankton → small fish → heron
3	Why can a heron receive energy from algae even though it does not eat algae?	The heron eats fish that ate zooplankton, and the zooplankton ate algae. Energy moves through these feeding relationships from the algae to the heron.
4	Predict one effect on the pond food web if disease greatly reduces the algae. Use evidence from the passage.	Zooplankton may decrease because they have less food. This can leave less prey for small fish and fewer fish for herons.

PART 3 • YOUR TURN (SAMPLE ANSWER)

oak tree → caterpillar → robin → hawk An oak tree uses sunlight to make sugars, so it is the producer at the base of this food chain. Energy moves to each consumer when it eats the organism before it.

Accept equivalent wording that identifies photosynthetic producers as the source of chemical energy for consumers. For the open task, accept any accurate four-organism chain that begins with a photosynthetic producer and has arrows moving from food to eater.