

Zoe's Spring Meadow Food Chain Adventure

Grade 4

science

spring meadow

Students will identify producers, consumers, and decomposers and trace energy flow through a spring meadow food chain.

Name: _____

Date: _____

1. Zoe steps into the spring meadow. She spots clover, grasshoppers, and robins. Which organism is the producer? Circle one: clover / grasshopper / robin. A producer makes its own food using sunlight.

2. Zoe writes in her meadow notebook. She labels each organism. A grasshopper eats clover. What do we call an organism that eats plants? Fill in the blank: A grasshopper is a _____.

3. Zoe finds a rare find — a full meadow food chain drawn on a flat stone! Put these in the correct order. Write 1, 2, 3, 4: ___ robin ___ clover ___ fox ___ grasshopper. Energy flows from the sun through each step.

4. Zoe notices something odd. All the clover in one patch has died. She wonders: if clover disappears, what happens to grasshoppers? Write one sentence. Use the word energy in your answer.

5. Zoe digs near a fallen log — her unique item find! She sees mushrooms breaking down dead leaves. True or False: Mushrooms are decomposers. True or False: Decomposers return nutrients to the soil. Circle True or False for each.

6. Zoe maps the meadow. She finds clover connects to grasshoppers, beetles, and caterpillars. Each of those connects to robins. Zoe says this is a food web, not just a food chain. Explain the difference between a food chain and a food web. Use two details.

7. Zoe observes that a farmer sprayed the meadow and the grasshopper population crashed. She forms a hypothesis. Which statement is the best hypothesis? Circle one: A) Fewer grasshoppers means more clover and fewer robins. B) Fewer grasshoppers means less clover and more foxes. Explain why you chose your answer using food chain reasoning.

8. Zoe reaches the hidden treasure at the center of the meadow — an ancient ecologist's journal! The final page asks: 'What would happen to this meadow's food web if the sun stopped shining for one month?' Zoe must write the journal's answer. Explain the effect on producers, consumers, and decomposers. Use the words energy, photosynthesis, and food web in your answer.

Answer Key: Zoe's Spring Meadow Food Chain Adventure

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Before starting, bring in a photo of a real spring meadow. Ask students to spot which organisms from Zoe's notebook — clover, grasshopper, robin, fox — they can find. This anchors Q3's food chain sequencing in a real visual.

- Zoe steps into the spring meadow. She spots clover, grasshoppers, and robins. Which organism is the producer? Circle one: clover / grasshopper / robin. A producer makes its own food using sunlight.

Answer: Q1: A producer makes its own food from sunlight. Clover is a green plant. Green plants use sunlight to make food through photosynthesis. Grasshoppers and robins eat other organisms — they cannot make their own food. Answer: clover is the producer.
- Zoe writes in her meadow notebook. She labels each organism. A grasshopper eats clover. What do we call an organism that eats plants? Fill in the blank: A grasshopper is a _____.

Answer: Q2: An organism that eats plants is called an herbivore or a primary consumer. Grasshoppers eat only plants (clover). They do not make their own food. Answer: A grasshopper is a consumer (also accepted: herbivore or primary consumer).
- Zoe finds a rare find — a full meadow food chain drawn on a flat stone! Put these in the correct order. Write 1, 2, 3, 4: ___ robin ___ clover ___ fox ___ grasshopper. Energy flows from the sun through each step.

Answer: Q3: Energy starts with the producer (plant) and moves to each consumer. Clover makes food from sunlight — it is step 1. The grasshopper eats clover — step 2. The robin eats the grasshopper — step 3. The fox eats the robin — step 4. Answer: clover = 1, grasshopper = 2, robin = 3, fox = 4.
- Zoe notices something odd. All the clover in one patch has died. She wonders: if clover disappears, what happens to grasshoppers? Write one sentence. Use the word energy in your answer.

Answer: Q4: Clover is the producer. It gives energy to grasshoppers. Without clover, grasshoppers lose their food source. No energy enters the food chain at that point. Answer example: If the clover disappears, grasshoppers will have no energy source and their population will decrease because they have nothing to eat.
- Zoe digs near a fallen log — her unique item find! She sees mushrooms breaking down dead leaves. True or False: Mushrooms are decomposers. True or False: Decomposers return nutrients to the soil. Circle True or False for each.

Answer: Q5: Decomposers break down dead plant and animal material and return nutrients to the soil. Mushrooms (fungi) are a classic decomposer. Statement 1 — Mushrooms are decomposers: TRUE. Statement 2 — Decomposers return nutrients to the soil: TRUE. Both statements are true.
- Zoe maps the meadow. She finds clover connects to grasshoppers, beetles, and caterpillars. Each of those connects to robins. Zoe says this is a food web, not just a food chain. Explain the difference between a food chain and a food web. Use two details.

Answer: Q6: A food chain shows one straight path of energy transfer (e.g., clover → grasshopper → robin). A food web shows many connected paths. Detail 1 — A food web includes multiple consumers eating the same producer (grasshoppers, beetles, and caterpillars all eat clover). Detail 2 — A food web shows that energy flows through many overlapping routes, making the ecosystem more stable. If one path is broken, energy can still flow through other paths. Answer: A food chain is one path; a food web is many connected paths showing real relationships in an ecosystem.

7. Zoe observes that a farmer sprayed the meadow and the grasshopper population crashed. She forms a hypothesis. Which statement is the best hypothesis? Circle one: A) Fewer grasshoppers means more clover and fewer robins. B) Fewer grasshoppers means less clover and more foxes. Explain why you chose your answer using food chain reasoning.

Answer: Q7: In the food chain: clover → grasshopper → robin → fox. If grasshoppers crash, robins lose their main food source and their population will also decrease. With fewer grasshoppers eating it, clover will grow more because nothing is consuming it. Option B says less clover and more foxes — that is incorrect because clover would increase without grasshoppers eating it, and foxes would decrease because robins (their food) also decrease. Answer: A is the best hypothesis. Fewer grasshoppers means clover grows more (nothing eats it), and robins decline (they lose their food source).

8. Zoe reaches the hidden treasure at the center of the meadow — an ancient ecologist's journal! The final page asks: 'What would happen to this meadow's food web if the sun stopped shining for one month?' Zoe must write the journal's answer. Explain the effect on producers, consumers, and decomposers. Use the words energy, photosynthesis, and food web in your answer.

Answer: Q8: This question traces energy removal from the base of the food web all the way through every level. Step 1 — Producers: Without sunlight, clover and all green plants cannot perform photosynthesis. They cannot make food. Producers die or stop growing. Step 2 — Primary consumers: Grasshoppers, beetles, and caterpillars lose their food source. With no plant energy entering the food web, primary consumer populations crash. Step 3 — Secondary and tertiary consumers: Robins and foxes lose their prey. Their populations also decline because no energy is flowing up from producers. Step 4 — Decomposers: As organisms die, decomposers like mushrooms and bacteria get a short-term increase in dead material to break down. They return nutrients to the soil. However, without new plant growth those nutrients stay unused. Conclusion: Without sunlight, photosynthesis stops, energy stops entering the food web, and the entire meadow ecosystem collapses from the bottom up. Zoe writes in the journal: 'Sunlight is the engine of every food web. Remove it and every living layer — producer, consumer, and even decomposer — is affected.' Answer: No sunlight → no photosynthesis → no producer energy → consumers at every level decline → food web collapses from the base upward.