

Garden Energy Trail

Trace how energy moves and matter cycles in a garden system.

5.5.E “investigate how energy flows and matter cycles through systems and how matter is conserved;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline each phrase that tells where energy moves or leaves as heat. Circle each phrase that tells where matter moves, changes form, or returns.

A Garden System

- ① On a school garden bed, sunlight warms a bean plant. The plant uses light energy to make sugar from water and carbon dioxide. A caterpillar eats the leaves, taking in stored chemical energy and plant matter. A robin eats the caterpillar. At each feeding step, some energy is used for movement, growth, and body warmth. Much of that energy leaves the organisms as heat.
- ② Later, fallen leaves, droppings, and the robin's body after it dies become food for decomposers such as fungi and bacteria. These organisms break materials into smaller substances. Some materials become part of the decomposers. Other materials return to the soil, water, or air. Bean plants can take in water, carbon dioxide, and soil nutrients again. Matter moves through the system and changes form.
- ③ For example, when the caterpillar uses sugar, it combines sugar with oxygen. It releases energy for life processes and gives off carbon dioxide and water. The atoms in the sugar are not destroyed. They are rearranged into new substances or become part of the caterpillar's body. Later, those same kinds of atoms may enter the air, soil, water, plants, animals, and decomposers. Energy flows one way, but matter cycles.

2 ANSWER WITH EVIDENCE Use the passage

- 1 Trace one path of energy from the Sun to the robin. What happens to much of the energy at each feeding step?

- 2 After decomposers break down materials, name two places the materials can return to.

- 3 What does the passage say happens to the atoms in sugar when the caterpillar uses it?

- 4 Why does matter cycle through the garden system while energy flows one way?

3 YOUR TURN Your own words

Create a three-panel sketch of a different ecosystem. Show energy moving from sunlight through two organisms, then show matter reaching decomposers and returning to a producer. Label your arrows Energy or Matter, and write one sentence explaining why matter is conserved.

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PART 1 • READ AND MARK

Underline each phrase that tells where energy moves or leaves as heat. Circle each phrase that tells where matter moves, changes form, or returns. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	Trace one path of energy from the Sun to the robin. What happens to much of the energy at each feeding step?	Sunlight moves to the bean plant, then to the caterpillar, then to the robin. Much of the energy leaves organisms as heat.
2	After decomposers break down materials, name two places the materials can return to.	The materials can return to the soil, water, or air.
3	What does the passage say happens to the atoms in sugar when the caterpillar uses it?	The atoms are not destroyed. They are rearranged into new substances or become part of the caterpillar's body.
4	Why does matter cycle through the garden system while energy flows one way?	Matter can change form and move among air, soil, water, plants, animals, and decomposers. Energy moves through organisms and much of it leaves as heat.

PART 3 • YOUR TURN (SAMPLE ANSWER)

Panel 1: Energy: sunlight to grass to rabbit. Panel 2: Matter: rabbit waste and dead grass to fungi and bacteria. Panel 3: Matter: decomposers to soil nutrients to grass. Matter is conserved because its atoms move and change form instead of disappearing.

Accept equivalent energy paths and matter-cycle examples that accurately show decomposers returning materials to a producer. The conservation explanation should state that matter is not destroyed, while energy eventually leaves the system as heat.