Where Food Goes

Trace food molecules through a plant and an animal.

7.LS1.7 "Develop a model to describe how food molecules in plants and animals are broken down and rearranged through chemical reactions to form new molecules that support growth and/or release of energy as matter moves through an organism."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline where food molecules are broken down, circle where smaller molecules are joined, and number three steps that trace food matter through one organism.

A Leaf Becomes a Meal

1. A sunflower seedling lifts its first leaves into the light. In those leaves, carbon dioxide from the air and water from the roots become sugar molecules and oxygen through chemical reactions powered by sunlight. The sugar is food the plant makes, not material created from nothing. Its carbon atoms came from carbon dioxide, and its hydrogen and oxygen atoms came from the starting materials. Some sugar travels through the stem to growing roots. Follow the atoms as molecules move and change inside this young plant.

2. In the roots, cells break down some sugar molecules in reactions with oxygen. These reactions produce carbon dioxide and water and release usable energy. Root cells use that energy to move minerals into the plant and to grow. Other sugar molecules are joined into cellulose, a large molecule that helps form sturdy new cell walls. The plant also stores some sugar as starch, another large molecule. Later, enzymes can break starch into smaller sugar molecules. The same food matter can take different paths, depending on what the plant needs.

3. A caterpillar bites a sunflower leaf. Its digestive system breaks the leaf's starch into smaller sugar molecules and breaks leaf proteins into amino acids. These smaller molecules move into its body cells. Some sugar reacts with oxygen, releasing energy and producing carbon dioxide and water. The caterpillar breathes out much of the carbon dioxide. Its cells join some amino acids into new proteins for growing muscles. The caterpillar does not turn food straight into energy: atoms from food can become new body molecules or leave the body in waste.

2 ANSWER WITH EVIDENCE

Use the passage

1. Trace the carbon atoms in a sugar molecule the seedling makes. What molecule did they come from, and where can the sugar travel next?

2. Describe a model of what happens when a root cell breaks down sugar. Name the other molecule used, two products, and what is released.

3. Trace one possible path from stored starch to a new cell wall in the plant. Where are molecules broken down, and where are they joined?

4. Trace the leaf proteins eaten by the caterpillar into a new part of its body. What smaller molecules form, and what does the caterpillar make from them?

3 YOUR TURN

Your own words

A bird eats the caterpillar. Draw a two-path arrow model showing how molecules from the caterpillar could help the bird grow muscle and release energy. Label the smaller molecules, where oxygen enters, the products of the energy-releasing reaction, and one place food atoms end up.

ANSWER KEY

Where Food Goes

GRADE 7 · 7.LS1.7

PART 1 · READ AND MARK

Underline where food molecules are broken down, circle where smaller molecules are joined, and number three steps that trace food matter through one organism. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Trace the carbon atoms in a sugar molecule the seedling makes. What molecule did they come from, and where can the sugar travel next?	**The carbon atoms came from carbon dioxide in the air. The sugar can travel through the stem to the roots.**
2	Describe a model of what happens when a root cell breaks down sugar. Name the other molecule used, two products, and what is released.	**Sugar reacts with oxygen to produce carbon dioxide and water and release usable energy.**
3	Trace one possible path from stored starch to a new cell wall in the plant. Where are molecules broken down, and where are they joined?	**Enzymes break stored starch into smaller sugar molecules. Sugar molecules can then be joined into cellulose for a new cell wall.**
4	Trace the leaf proteins eaten by the caterpillar into a new part of its body. What smaller molecules form, and what does the caterpillar make from them?	**Digestion breaks leaf proteins into amino acids. The caterpillar joins some amino acids into new proteins for growing muscles.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Growth path: caterpillar proteins → amino acids → new proteins in bird muscle. Energy path: caterpillar sugar + oxygen from the air → carbon dioxide + water + released energy in bird cells. Some food atoms end up in muscle proteins; others leave in carbon dioxide the bird breathes out.

Accept arrow models that correctly separate the growth path from the energy-release path. Students may show food atoms ending in new body molecules or in carbon dioxide breathed out.