Food's Molecule Journey

Track matter and energy through an organism.

MS-LS1-7 "Develop a model to describe how food is rearranged through chemical reactions forming new molecules that support growth and/or release energy as this matter moves through an organism..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline words that show matter moving through the organism. Circle words that show molecules breaking apart or forming, then number the main pathway locations in order.

From Lunch to Movement

1. At lunch, Maya eats a bean-and-rice wrap. Its food molecules contain atoms, including carbon, hydrogen, and oxygen. As the wrap moves through her digestive system, it is physically mashed and mixed. Then enzymes help break large food molecules into smaller molecules that can pass into her blood. This is not the end of the story. Cells receive these smaller molecules and use them as starting materials. Matter from the lunch is now moving through Maya's body, rather than staying in the wrap.

2. Inside a muscle cell, some of the smaller molecules are broken apart further through chemical reactions. Their atoms do not disappear. Instead, the atoms are rearranged into new molecules. During this rearranging, energy is released. The cell can use some released energy to contract the muscle as Maya climbs stairs. Other new molecules can become materials for building or repairing cell parts. A model of this process should show food molecules entering, smaller molecules moving to cells, atoms being rearranged, new molecules forming, and energy being released for cell activities.

3. Not every part of the lunch becomes a muscle material. Some newly formed molecules move on and may leave the body as wastes. Yet the atoms are still matter, even when they are in a different molecule or leave the organism. This is why a model uses arrows and labels. Arrows can track matter from food to blood to cells and then to new molecules or wastes. A separate label can show energy released during chemical reactions. Energy helps power activities, but it is not a kind of matter moving in the arrows.

2 ANSWER WITH EVIDENCE

Use the passage

1. How is physically mashing and mixing food different from the chemical changes described in a cell?

2. Write the matter pathway from Maya's wrap to her cells using arrows.

3. What happens to the atoms when molecules are broken apart in a cell, and how can the new molecules support growth or repair?

4. What two kinds of information should a model show to explain what happens to food in an organism?

3 YOUR TURN

Your own words

Draw a labeled arrow model for a different food moving through an organism. Your model must show food molecules becoming smaller molecules, moving through blood to a body cell, chemical reactions that break molecules apart and rearrange atoms into new molecules, and released energy used for one activity.

ANSWER KEY

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GRADES 6-8 · MS-LS1-7

PART 1 · READ AND MARK

Underline words that show matter moving through the organism. Circle words that show molecules breaking apart or forming, then number the main pathway locations in order. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How is physically mashing and mixing food different from the chemical changes described in a cell?	**Mashing and mixing physically change the food. Chemical reactions break molecules apart and rearrange atoms into new molecules.**
2	Write the matter pathway from Maya's wrap to her cells using arrows.	**Food molecules in the wrap → smaller molecules → blood → cells.**
3	What happens to the atoms when molecules are broken apart in a cell, and how can the new molecules support growth or repair?	**The atoms do not disappear. They are rearranged into new molecules, some of which become materials for building or repairing cell parts.**
4	What two kinds of information should a model show to explain what happens to food in an organism?	**A model should show matter moving and being rearranged into new molecules, and it should show energy released during chemical reactions for cell activities.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Yogurt food molecules → smaller molecules after digestion → blood → skin cell. In the skin cell: smaller molecules → chemical reactions, molecules break apart and atoms rearrange → new molecules that help repair cell parts; released energy → cell activity for repair.

Accept models that accurately track matter from food to smaller molecules, blood, and cells, then show atoms rearranged into new molecules. The energy label must be separate from matter arrows and must show energy released for a cell activity.