Properties and Changes in Matter - Physical and Chemical Changes During Digestion

**Warm-up:** What happens to food in the digestive system? What is the difference between a chemical and physical change?

**Vocabulary**

- **physical change:** a change to the shape, size, temperature, or other physical property of a substance
- **chemical change:** a change to the chemical make-up of a substance
- **digestive system:** the body system that breaks apart food to obtain nutrients for the body
- **enzyme:** a substance that speeds up a chemical reaction in an organism
- **chyme:** the watery, partly digested food that leaves the stomach
Key Concepts

• A physical change changes the appearance of matter but does not change its chemical makeup. Cutting, bending, crushing, and mixing with water are examples of physical changes. Even melting is a physical change. When frozen water melts, it becomes liquid water, but it is still water.

• In a chemical change, matter changes its chemical makeup. Rusting is an example of a chemical change. When iron rusts, it combines with oxygen and becomes a new compound, iron oxide, or rust.

• The body needs nutrients to work and grow. To get these nutrients, the body must digest food, or break it down into smaller, simpler substances. The digestion of food involves both physical and chemical changes.

• Digestion begins in the mouth. The teeth mash food—a physical change. The food mixes with the water in saliva—another physical change. Enzymes in saliva help break apart some of the starches in food, turning them into sugars—a chemical change. Other enzymes help break apart fats—also a chemical change.

• Physical and chemical changes also occur to food in the stomach. The stomach’s muscular walls move food back and forth, mixing food particles together. This is a physical change. The stomach also releases stomach acid and more enzymes. These break apart food with chemical changes.

• Food moves from the stomach to the small intestine as a thick liquid called chyme. In the small intestine, chemicals from the liver and enzymes from the pancreas break the food down even further through chemical changes. Nutrients from the food are now small enough and simple enough to be absorbed into the blood. The rest of the matter moves through the large intestine and later leaves the body as waste.

Answer in complete sentences.

Why are both physical and chemical changes important for food to be digested properly?