Matter in Action

Trace atoms, mixtures, and energy-driven phase changes.

5.7 "The student will investigate and understand that matter has properties and interactions. Key ideas include matter is composed of atoms; substances can be mixed together without changes in their physical properties..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline the sentence that explains what matter is made of. Circle the two physical properties that remain after mixing, then number the two phase changes caused by energy, 1 and 2.

Maya's Material Test

1. At the school garden, Maya examined a jar holding iron filings and sand. Both materials are matter because they take up space and have mass. Every piece of matter is made of tiny particles called atoms. Iron atoms make up the iron filings, and atoms in the sand make up the sand. Atoms are far too small to see with a classroom magnifier.

2. Maya used a magnet to pull the iron filings away from the sand. The materials had been mixed, but no new substance formed. The iron still was attracted to a magnet, and the sand still had its grainy texture. Mixing substances can place them together while their physical properties remain. A physical property is a feature that can be observed or measured.

3. Next, Maya put liquid water into an ice tray and placed it in a freezer. Energy moved from the water to the colder freezer air. As the water lost thermal energy, it froze into solid ice. Later, ice left on a sunny table gained energy from its warmer surroundings and melted back into liquid water. The water was still made of the same atoms.

2 ANSWER WITH EVIDENCE

Use the passage

1. What tiny particles make up all matter?

2. What two observations showed that iron filings and sand kept their physical properties after being mixed?

3. What happened to the water when it lost thermal energy in the freezer?

4. What happened when the ice gained energy on the sunny table?

3 YOUR TURN

Your own words

Create a three-panel science sketch. In Panel 1, show a mixture of steel paper clips and dry beans, and label one physical property of each. In Panel 2, show how a magnet separates the paper clips, and write that the materials are made of atoms. In Panel 3, show an ice cube becoming liquid water, and label the energy change.

Matter in Action

PART 1 · READ AND MARK

Underline the sentence that explains what matter is made of. Circle the two physical properties that remain after mixing, then number the two phase changes caused by energy, 1 and 2. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	What tiny particles make up all matter?	**Atoms make up all matter.**
2	What two observations showed that iron filings and sand kept their physical properties after being mixed?	**The iron was still attracted to a magnet, and the sand still had a grainy texture.**
3	What happened to the water when it lost thermal energy in the freezer?	**Energy moved from the water to the colder freezer air, and the liquid water froze into solid ice.**
4	What happened when the ice gained energy on the sunny table?	**The ice gained energy from warmer surroundings and melted into liquid water. It was still made of the same atoms.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: A bowl holds steel paper clips and dry beans. Labels: paper clips are attracted to a magnet; beans have a smooth surface. Panel 2: A magnet lifts out the paper clips. Both substances are made of atoms, and their physical properties remain. Panel 3: An ice cube becomes liquid water. The ice gains thermal energy.

Accept equivalent descriptions of atoms, retained physical properties, and energy causing freezing or melting. For the sketch, accept accurate labels and drawings that show separation by magnet and ice gaining energy as it melts.