Where Did It Go?

Follow heat and particles as water changes state.

P.3.5 "Students will demonstrate an understanding of the physical properties of matter to explain why matter can change states between a solid, liquid, or gas dependent upon the addition or removal of heat..."

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline places where matter gains or loses heat, and circle each change of state. Use your marks to connect heat with what happens to matter.

Maya's Water Tests

1. On a warm day, Maya puts one ice cube in each of two matching cups. She sets one cup on the kitchen counter and one in the refrigerator. She checks both cups every five minutes. After twenty minutes, the counter cup holds more liquid water. Both ice cubes gain heat from their surroundings, but the warmer counter area gives heat faster. Heat makes solid ice melt into liquid water.

2. Ice and water are made of tiny particles that are too small to see. In solid ice, the particles stay close and move a little in place. As ice takes in heat, its particles move faster. In liquid water, they can move past one another. Maya puts the liquid water in a freezer. As the water cools, its particles slow down. When it freezes, they move a little in place again.

3. Maya also sees tiny drops on the outside of a cold cup. The drops did not leak through the cup. Water in the air is an invisible gas called water vapor. When this gas touches the cold cup, it loses heat. Its particles move more slowly and come closer together. The gas changes into liquid drops. This change is called condensation. Maya could compare a cold cup with a room-temperature cup.

2 ANSWER WITH EVIDENCE

Use the passage

1. How does Maya's test help her find out what heat does to ice?

2. What happens to the particles as ice gains heat and melts?

3. Why does Maya's liquid water freeze in the freezer? Include heat and particles in your answer.

4. Where do the drops on the outside of the cold cup come from, and why do they form?

3 YOUR TURN

Your own words

A puddle on a warm sidewalk dries up. In two panels, draw the water particles in the puddle and then in the air. Use dots and arrows to show where the particles are and how they move, then write one sentence explaining how heat changes the water.

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PART 1 · READ AND MARK

Underline places where matter gains or loses heat, and circle each change of state. Use your marks to connect heat with what happens to matter. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	How does Maya's test help her find out what heat does to ice?	**She puts an ice cube in each matching cup and checks them at the same times. The cube in the warmer place melts more.**
2	What happens to the particles as ice gains heat and melts?	**They move faster. In liquid water, they can move past one another.**
3	Why does Maya's liquid water freeze in the freezer? Include heat and particles in your answer.	**The water loses heat as it cools. Its particles slow down, and the water becomes solid ice.**
4	Where do the drops on the outside of the cold cup come from, and why do they form?	**They come from water vapor in the air. The vapor loses heat at the cold cup and changes into liquid drops.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

Panel 1: Dots close together in a puddle, with short arrows showing movement. Panel 2: Dots spread far apart in the air, with longer arrows pointing in different directions. Sentence: Heat from the warm sidewalk makes water particles move faster, so liquid water becomes water vapor in the air.

Accept particle drawings that show liquid particles close together and gas particles spread apart. The sentence should connect added heat to faster particle motion and the change from liquid to gas.