

Energy on the Move

Track how thermal energy causes water to change phase.

6.6.c “thermal energy has a role in phase changes;”

NAME _____

DATE _____

1 READ AND MARK _____ Read it twice

YOUR JOB Underline words that show thermal energy entering or leaving a substance. Circle each phase change, then write matching numbers beside the energy transfer and the phase change it causes.

Water at the Rink

- ① Before a hockey practice, a worker pours a thin layer of water onto a cold rink. The water soon becomes solid ice. Thermal energy moves from the warmer water to the colder rink and air. As the water loses thermal energy, its particles move less freely. They settle into a fixed pattern, and freezing occurs. The temperature stays at the freezing point while the water changes from liquid to solid, even though thermal energy continues to leave the water.
- ② Later, sunlight warms a snowman beside the rink. Thermal energy transfers from the warmer sunlight-warmed ground and air to the colder snow. The snow particles gain energy and move more freely. At the melting point, added thermal energy is used to loosen the particles from their fixed pattern. The temperature does not rise during this change. Instead, the snow melts, changing from solid ice to liquid water. Once all the ice has melted, added thermal energy can raise the temperature of the liquid water.
- ③ Phase changes can also happen between liquid water and water vapor. In a kettle, water gains thermal energy from the hot burner. Some particles gain enough energy to escape the liquid as water vapor, a change called evaporation. On a cool window, water vapor loses thermal energy to the glass. Its particles slow down and come closer together, forming liquid drops. This change is condensation. In each case, thermal energy moves into or out of the substance, causing a change in particle motion and phase.

2 ANSWER WITH EVIDENCE _____ Use the passage

1 When the rink water freezes, where does thermal energy move, and what phase change occurs?

2 What happens to the water's temperature while it freezes, even though thermal energy leaves it?

3 During snow melting, what is the added thermal energy used for?

4 Compare the kettle and the cool window. For each place, tell whether water gains or loses thermal energy and name the phase change.

3 YOUR TURN _____ Your own words

Write three sentences about a phase change you might observe at home. Name the beginning and ending phases, tell whether the substance gains or loses thermal energy, and explain how its particles move.

PART 1 • READ AND MARK

Underline words that show thermal energy entering or leaving a substance. Circle each phase change, then write matching numbers beside the energy transfer and the phase change it causes. Accept any marking that follows this job and points at the right text.

PART 2 • ANSWERS

#	QUESTION	ANSWER
1	When the rink water freezes, where does thermal energy move, and what phase change occurs?	Thermal energy moves from the warmer water to the colder rink and air. The water freezes, changing from liquid to solid.
2	What happens to the water's temperature while it freezes, even though thermal energy leaves it?	Its temperature stays at the freezing point.
3	During snow melting, what is the added thermal energy used for?	It is used to loosen the snow particles from their fixed pattern.
4	Compare the kettle and the cool window. For each place, tell whether water gains or loses thermal energy and name the phase change.	In the kettle, water gains thermal energy and evaporates from liquid water to water vapor. On the cool window, water vapor loses thermal energy and condenses into liquid drops.

PART 3 • YOUR TURN (SAMPLE ANSWER)

A tray of liquid water is placed in a freezer and becomes solid ice. The water loses thermal energy to the colder freezer air. Its particles move less freely and settle into a fixed pattern as freezing occurs.

Accept accurate everyday examples of melting, freezing, evaporation, or condensation. The response should correctly connect thermal energy gained or lost to particle motion and the stated phase change.