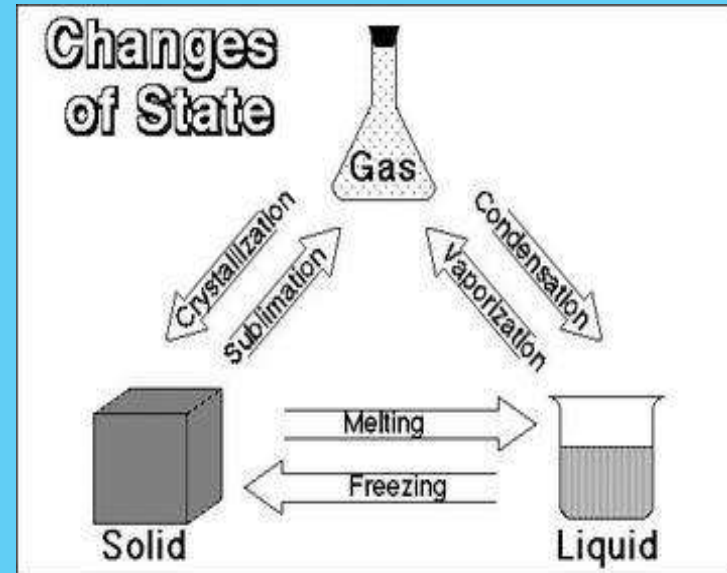


Changes of State

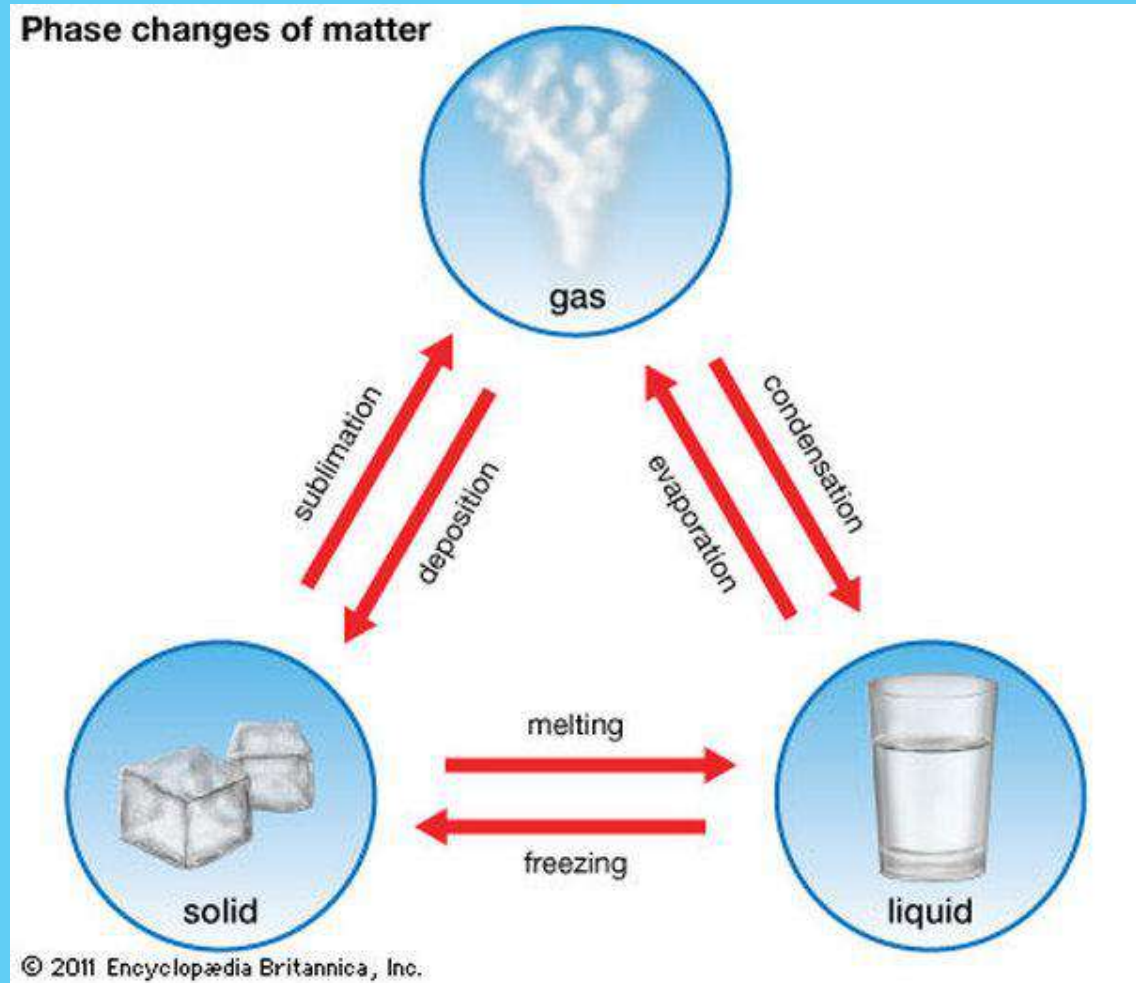
Objectives

- **Describe** how energy is involved in changes of state.
- **Describe** what happens during melting and freezing.
- **Compare** evaporation and condensation.
- **Explain** what happens during sublimation.
- **Identify** the two changes that can happen when a substance loses or gains energy.



I. Energy and Changes of State

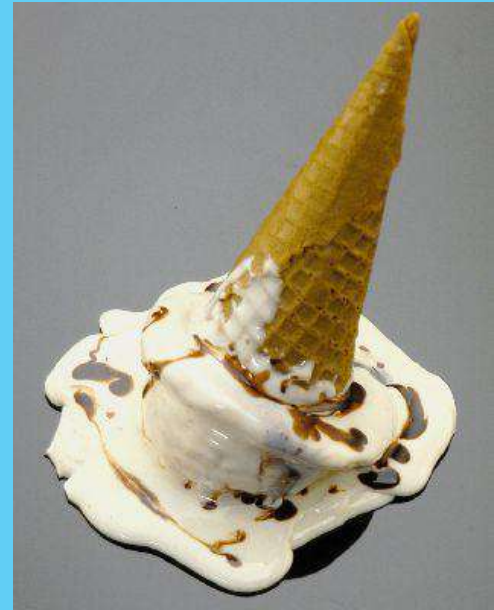
A. From Solid to Liquid to Gas A change of state is the change of a substance from one physical form to another. All changes of state are physical changes. The particles have different amounts of energy when the substance is in different states.



II. Melting: Solid to Liquid

A. What Is Melting?

Melting is the change of state from a solid to a liquid.



B. Adding Energy: When a solid is at its melting point, any energy added to it is used to overcome the attractions that hold the particles in place.



III. Freezing: Liquid to Solid

A. What Is Freezing? The change of state from a liquid to a solid is called freezing.

B. Removing Energy:
Removing energy will cause the particles in a liquid to begin locking into place.



IV. Evaporation: Liquid to Gas

A. Boiling and Evaporation: Evaporation is the change of a substance from a liquid to a gas. Boiling is the change of a liquid to a vapor, or gas, throughout the liquid.

B. Effects of Pressure on Boiling Point: Earlier, you learned that water boils at 100°C . In fact, water boils at 100°C only at sea level, because of atmospheric pressure. Atmospheric pressure is caused by the weight of the gases that make up the atmosphere.



V. Condensation: Gas to Liquid

A. What Is Condensation? Condensation is the change of state from a gas to a liquid.



VI. Sublimation: Solid to Gas

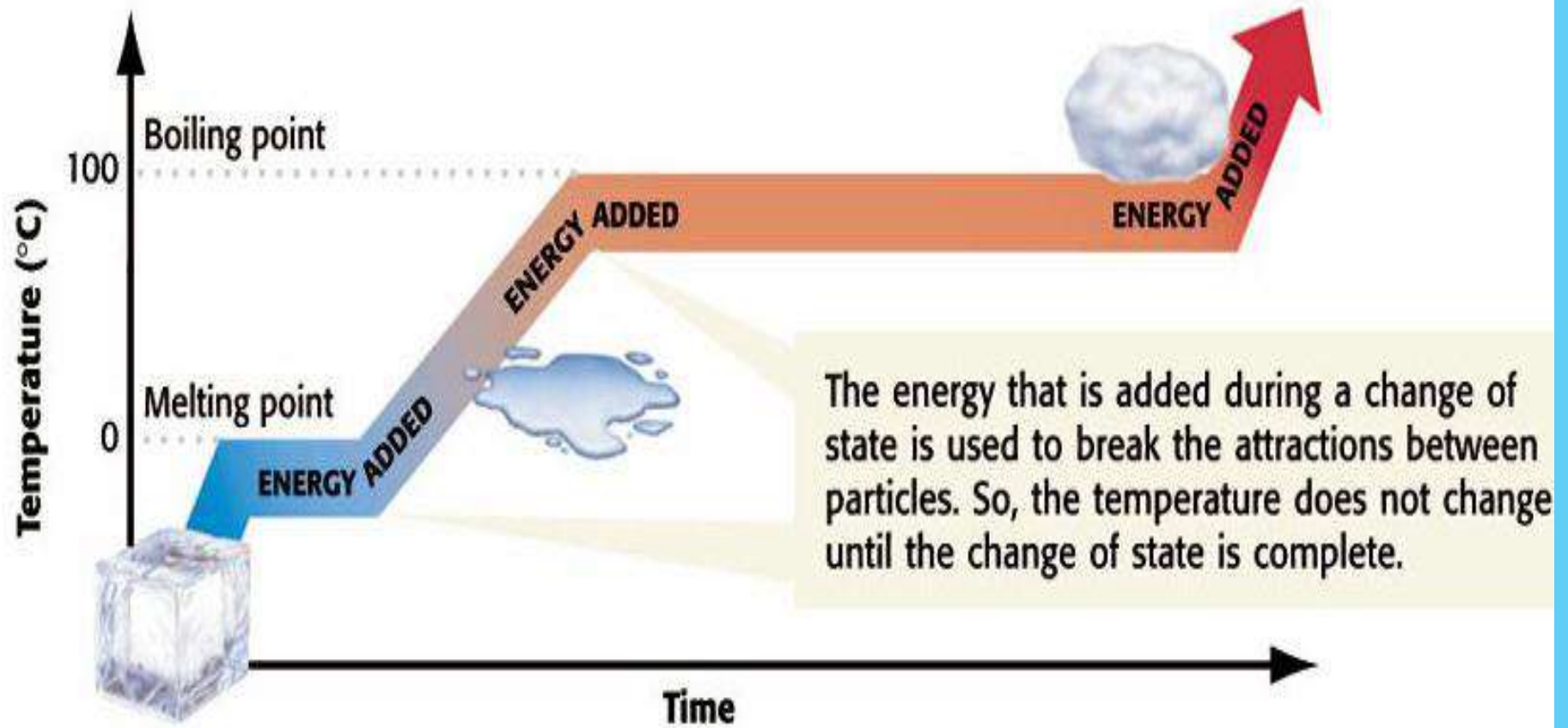
A. What Is Sublimation? Sublimation is the change of state in which a solid changes directly into a gas.



VII. Change of Temperature vs. Change of State

A. Losing or Gaining Energy When most substances lose or gain energy, one of two things happens to the substance: its temperature changes or its state changes. The temperature of a substance is related to the speed of the substance's particles. So, when the temperature of a substance changes, the speed of the particles also changes. But the temperature of a substance does not change until the change of state is complete.

Changing the State of Water



Word Bank

- Changes of state
- Melting
- Vaporization
- Liquid
- Condensation
- States of matter
- Solid

