

Unit 2

NAME

Class Work

10/10/13

2.7 Heating Curve

SPARK

1. The temperature of a sample of matter is a measure of the
 - a. Average kinetic energy of its particles
 - b. Average potential energy of its particles
 - c. Total kinetic energy of its particles
 - d. Total potential energy of its particles

Agenda:

- SPARK
- Objective
- Review
- Analogy
- Homework



Objective

SWBAT describe the shape of a heating or cooling curve as a substance changes from a solid to a gas.

Heat vs. Temperature

An Exploration!!

Rules!

1. 1 post-it equals 1 Joule.
2. Each student represents a particle.
3. You may only pass a post-it to another student with less post-its than you.
4. Some of you will start with TEN post-its.
5. Others will start with ONE post-it.

Heat vs. Temperature

Debrief

Answer these questions with your group:

1. What did you notice about the number of post its or kinetic energy that students had at the beginning versus after 3 minutes?
2. How does this relate to a hot cup of coffee that you leave out for a while?
3. Why did we have the rule that you can only pass a post-it to someone with less post-its than you? How does this represent the direction of heat transfer?

Application

STOP AND JOT (alone)

- How does this relate to placing an ice cube in cold water?

KEY IDEA

Heat always moves from a higher temperature to a lower temperature.

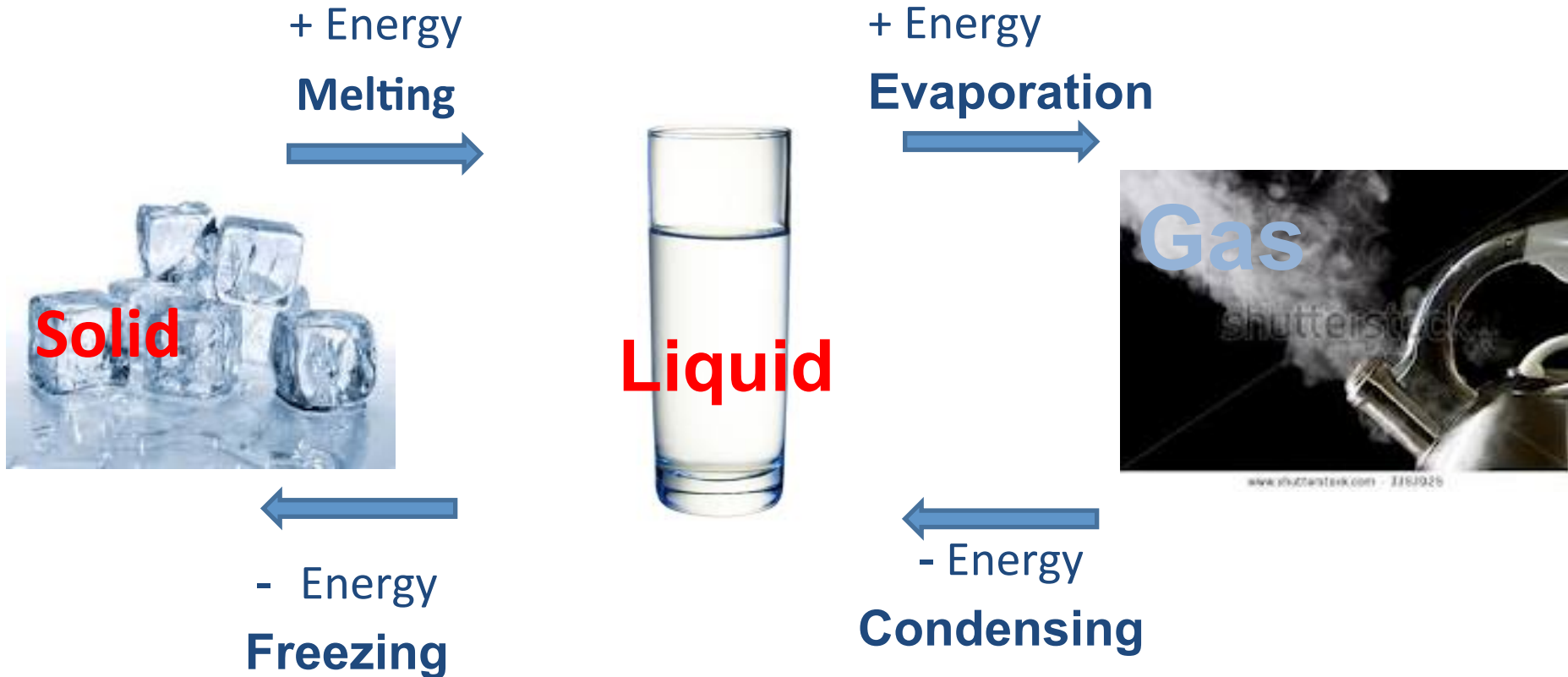
FINISH HOMEWORK

2.6 HW sheet

LAB #4 TIME!

- 8 minutes to complete first page
- Class wide lab
- Collect data, make a graph

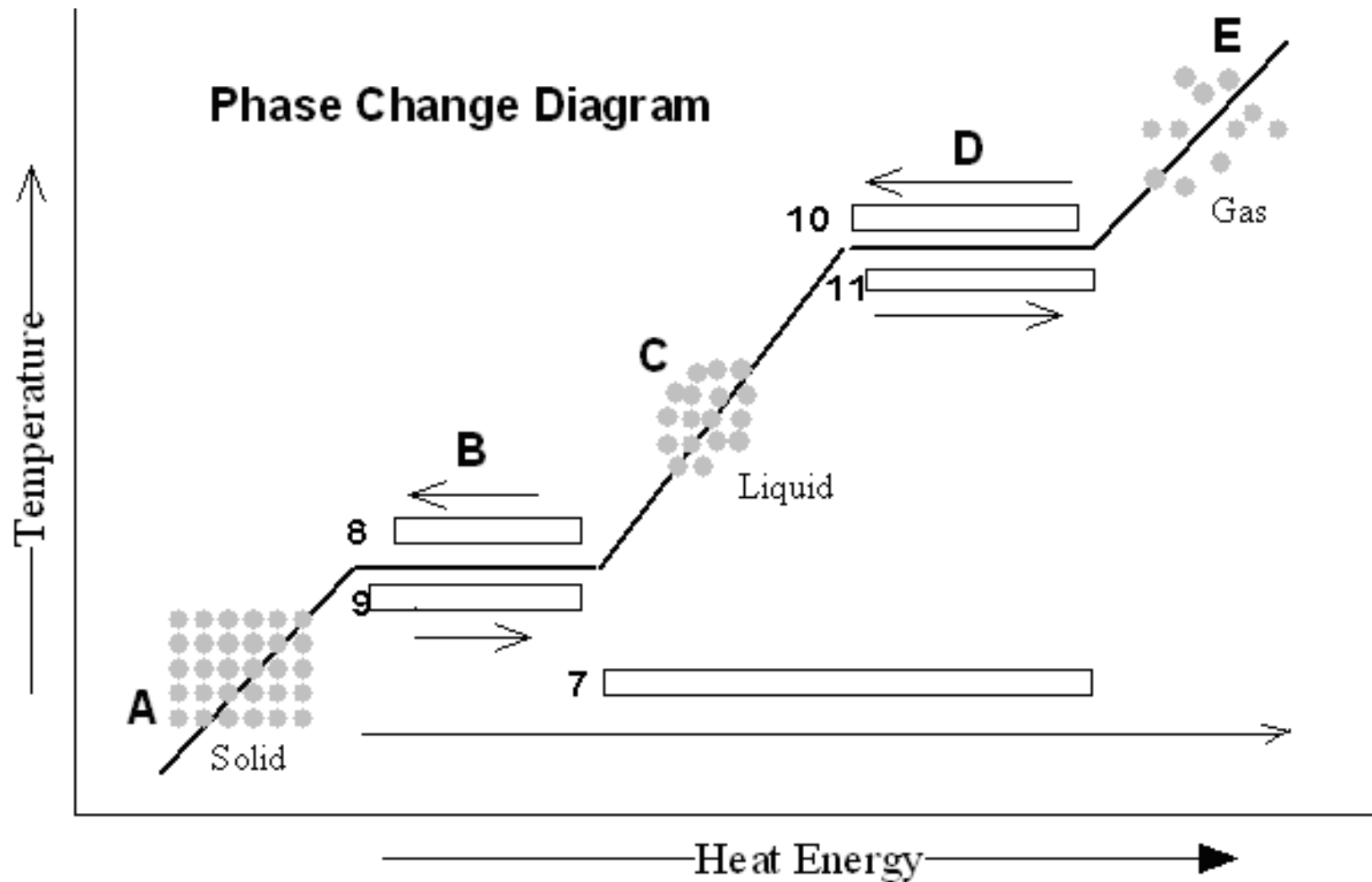
Phase Changes



Heating Curves

- Heating curves show how the temperature changes as a substance is heated up.

Let's Label this!



Physical Properties on a Heating Curve

B = melting point

temperature at which solid intermolecular bonds are broken, turning substance into a liquid.

Melting, also known as FUSION

What does intermolecular mean?

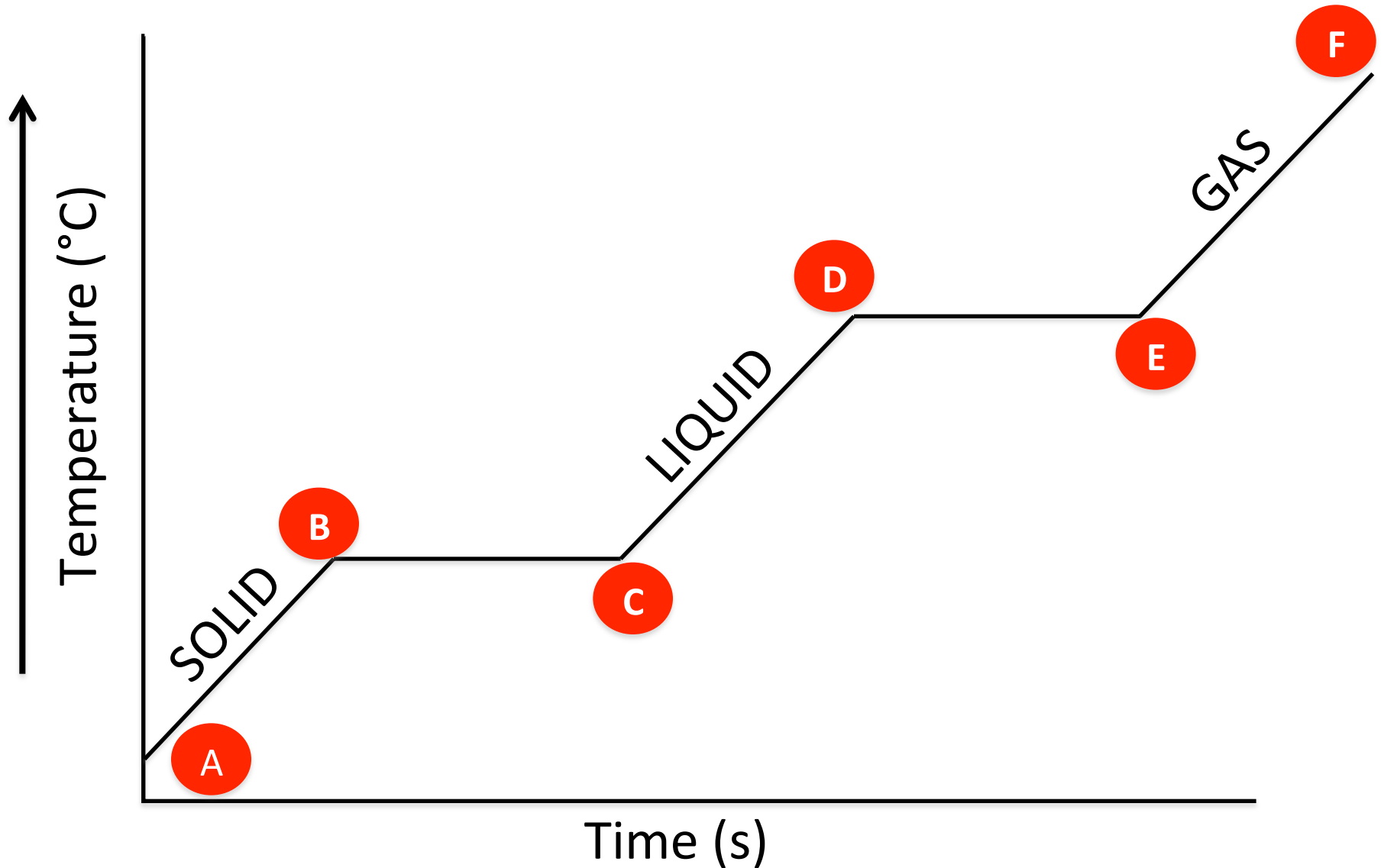
Physical Properties on a Heating Curve

D = boiling point

temperature at which liquid intermolecular bonds are broken, turning substance into a gas.

Boiling, also known as VAPORIZATION

Heating Curves



What's Happening on a Heating Curve?

SECTION	What's happening?	# of Phases Present	PE or KE
AB	Heating of a solid	1	KE increases
BC	Melting of a solid	2	PE increases, KE constant
CD	Heating of a liquid	1	KE increases
DE	Boiling of a liquid	2	PE increases, KE constant
EF	Heating of a gas	1	KE increases

HOMEWORK

Study for RETAKE test – make cheat sheet

Work on argumentative paper

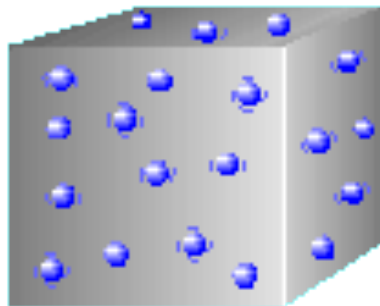
Update glossary

Complete any missing assignments

Extra

Phase Changes - Energy

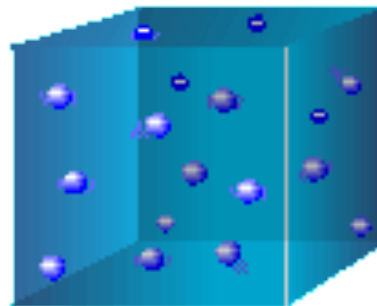
- In order to change the phase of a substance, energy must be absorbed or released in the form of heat.
- At higher temperatures, particles have more kinetic energy and can move further apart, overcoming the *intermolecular forces*.



SOLID

vibration only

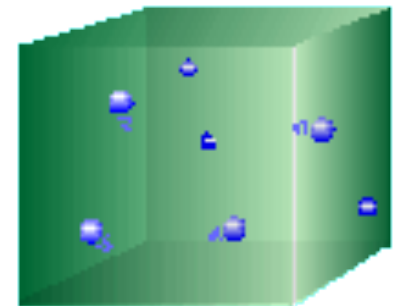
close together



LIQUID

some rotation,
vibration and
translation

further apart



GAS

mainly
translation

very far apart

Phase Changes

When you are going from the solid phase to a gaseous phase, it is endothermic, energy needs to be added.

- Temperature is increased
- Particles are spread further apart

Phase Changes

When you are going from the gaseous phase to a solid phase, it is exothermic, energy is released.

- Temperature is decreased
- Particles are brought closer together

During the phase change, temperature does not increase or decrease. All energy absorbed or released goes into rearranging the particles in the material (potential energy!)