

Bell Work, Apr 28 – May 1 , 2014

Test Review from Matter & Change
Test

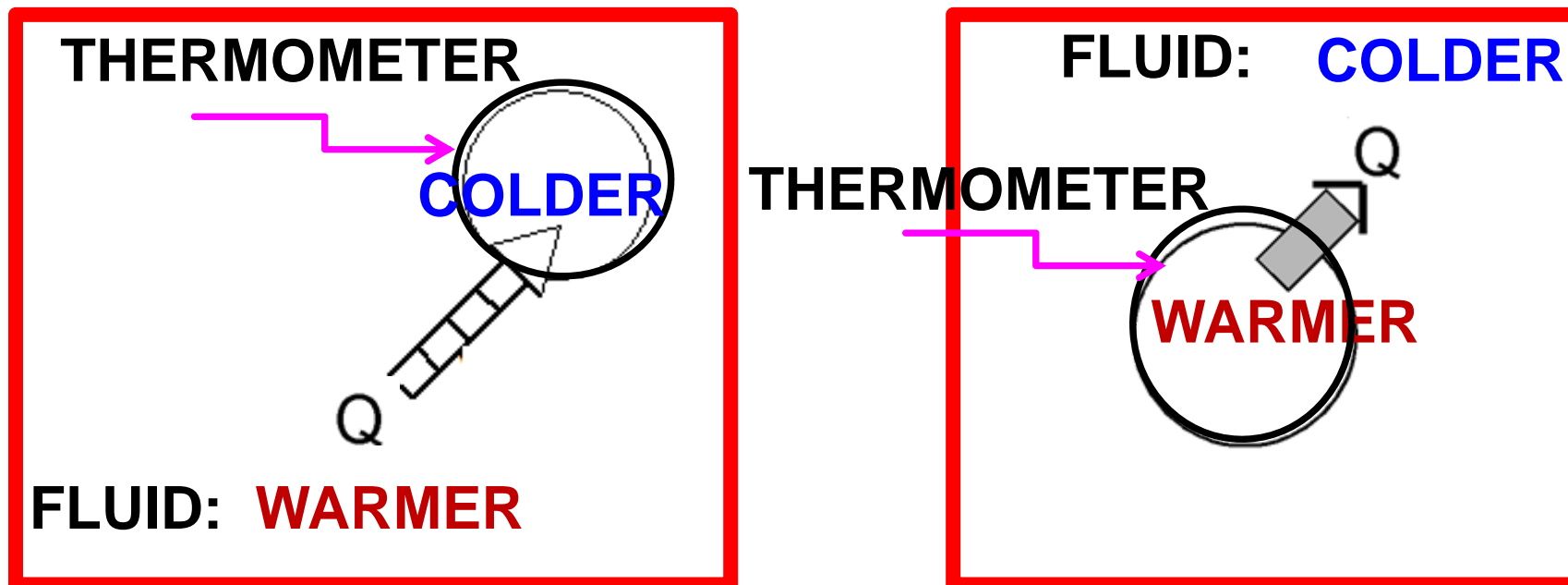
Bell Work, Monday, 4/28/14

1. Q = heat, fluids are liquids & gasses

- the circle is the thermometer (the system), the square is the fluid (the surroundings).

- Heat always flows from:**
 - **hot to cold (high to low)**

Draw the diagrams



Bell Work, Monday, 4/28/14

2. Matching: contracts, expands

When a liquid or gas is heated it expands

When a liquid or gas is cooled it contracts

3. Explain why the mercury or alcohol level in a thermometer rises when it is placed in a warmer fluid. (3-step process)

Step 1: energy transfer (hot to cold or cold to hot?)

Step 2: speed

Step 3: hint: see #2

Resulting in:

4. Explain why the mercury or alcohol level in a thermometer falls when it is placed in a colder fluid. Use the 3-step process from #3.

Bell Work, Monday, 4/28/14

3. Explain why the mercury or alcohol level in a thermometer rises when it is placed in a warmer fluid. (3-step process)

- 1. Energy from the warmer fluid (the surroundings) is transferred to the liquid in the thermometer.**
- 2. This energy causes the alcohol molecules to move faster.**
- 3. The alcohol molecules move further apart (expand).**

Result: alcohol rises in the tube.

4. Explain why the mercury or alcohol level in a thermometer falls when it is placed in a warmer fluid. (3-step process).

- 1. Energy from the warmer thermometer is transferred to the fluid (the surroundings).**
- 2. This energy loss causes the alcohol molecules to move slower.**
- 3. The alcohol molecules move closer together (contract).**

Result: alcohol goes down in the tube.

Bell Work, Tuesday, 4/29/14 (6 questions)

1. Define energy.

Energy is a conserved substance-like quantity that is stored in various ways and transferred in various ways.

2. What is kinetic energy

Kinetic energy is the energy of motion.

3. What is thermal energy?

Thermal energy (E_{th}) is related to the motion (speed) of the particles and is measured by temperature.

4. What is phase energy?

Phase energy is the energy needed to separate (pull apart) molecules.

5. How is energy transferred from one particle to another?

Energy is transferred from particle to particle via collisions among the particles.

Bell Work, Tuesday, 4/29/14

6. State the kinetic molecular theory

- a) Matter is made up of particles.
- b) Particles are in constant motion.
 - One exception: at a temperature of absolute zero (-273°C , 0°K), all motion stops.
- c) The speed of the particles is related to their temperature.
- d) When energy is transferred to a sample of matter, either the particles speed up resulting in the temperature increasing and the thermal energy increasing or they get pulled apart resulting in the phase energy increasing and a phase change, but not both at the same time.

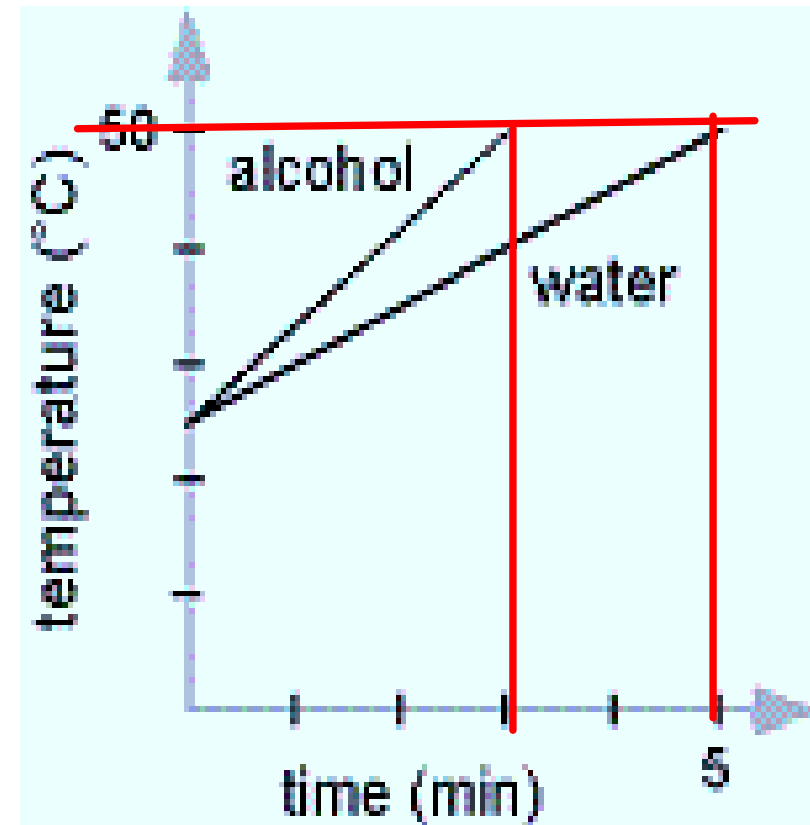
Bell Work, Wednesday, Apr 30, 2013 (3Q)

1. Equal masses of water and alcohol, at 25°C , are heated at the same rate. After 3 minutes the temperature of the alcohol is 50°C . It took 5 minutes for the water to reach 50°C . Which of the following is true once the water and alcohol have both reached 50°C ?

- a. The water received more energy than the alcohol.
- b. The alcohol received more energy than the water.
- c. Both received the same amount

2. Explain gas pressure

Pressure of gases is explained in terms of the frequency and force of impact of collisions of the particles with the sides of the container. More particles mean more collisions.



Amount of Energy \Rightarrow

Bell Work, Wednesday, Apr 30, 2013

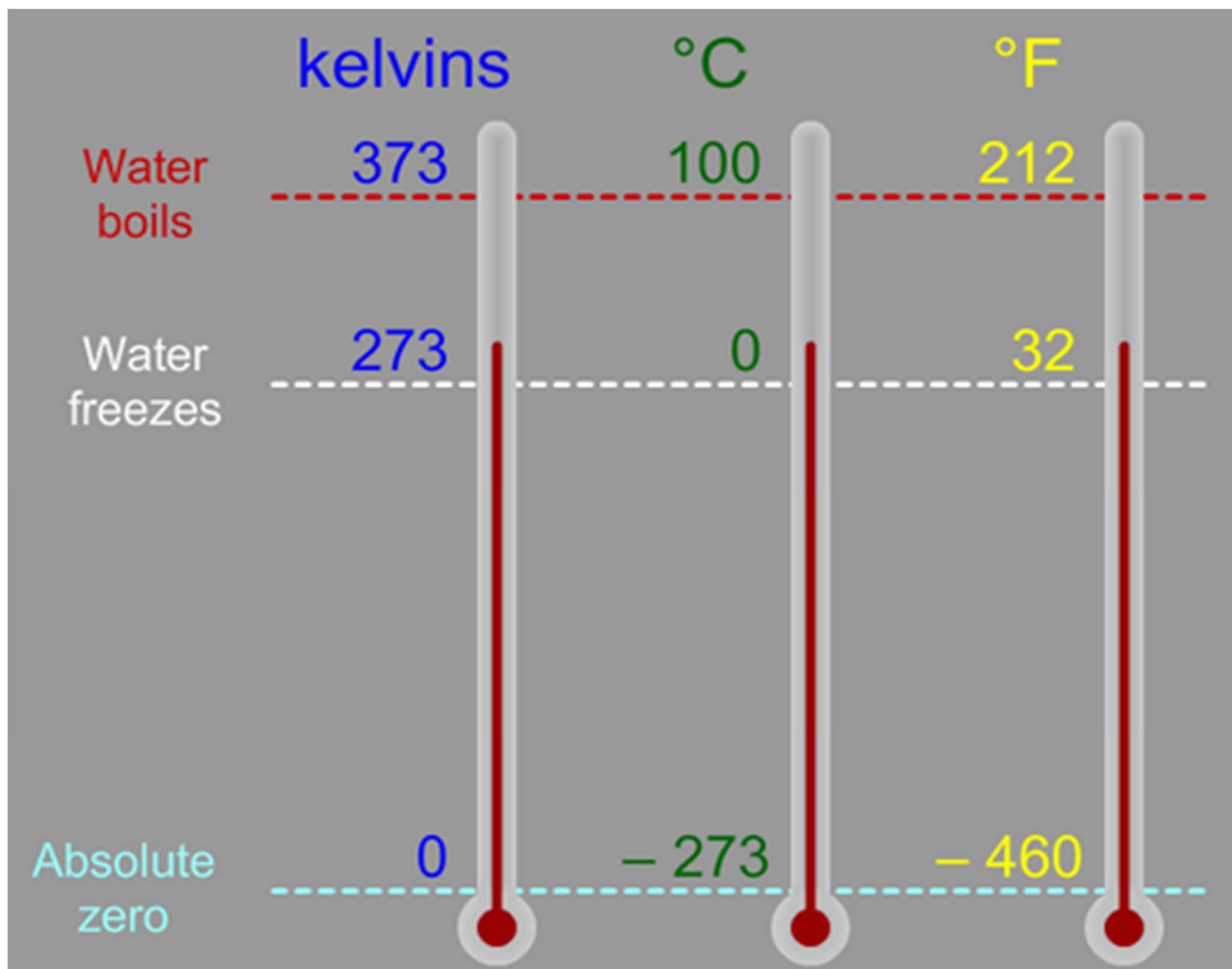
Draw the chart

3. Compare and contrast temperature measured in the Celsius scale and the absolute (aka: Kelvin scale).

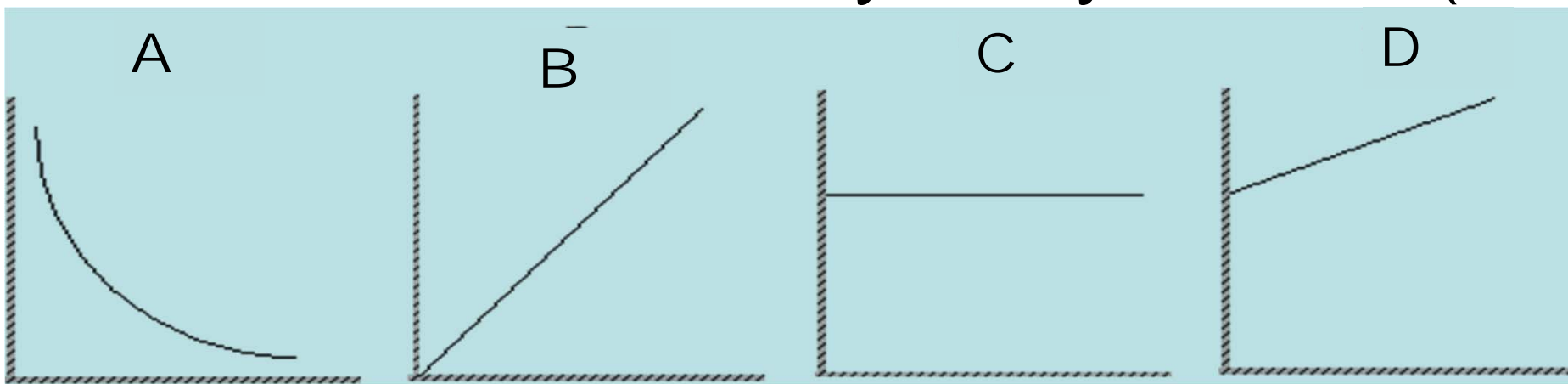
Compare: $1^{\circ}\text{C} = 1^{\circ}\text{K}$

Contrast: Celsius begins at -273, kelvin begins at 0, and:

	Celsius	Absolute (Kelvin)
Boiling point of water	100	373
Room temperature	25	298
Freezing Point of Water	0	273
Absolute zero	-273	0



Bell Work, Thursday , May 1, 2014 (8 Q)



1. Which graph represents the relationship between the pressure of a gas and its volume **A** B C D

2. Which graph represents the relationship between the volume of a gas and the Celsius temperature?

A

B

C

D

3. Which graph represents the relationship between the volume of a gas and the Kelvin (absolute) temperature?

A

B

C

D

4. Which graph represents the relationship between the pressure of a gas and the number of particles? A **B** C D

Bell Work, Thursday, May 1, 2014

5. The pressure exerted by a gas in a container depends on

- a. the space between the molecules
- b. the instrument used to measure the pressure
- c. the number of collisions between gas molecules and other gas molecules
- ☒ d. the number of collisions between gas molecules and the walls of the container



6. When a sample of gas is cooled, its thermal energy

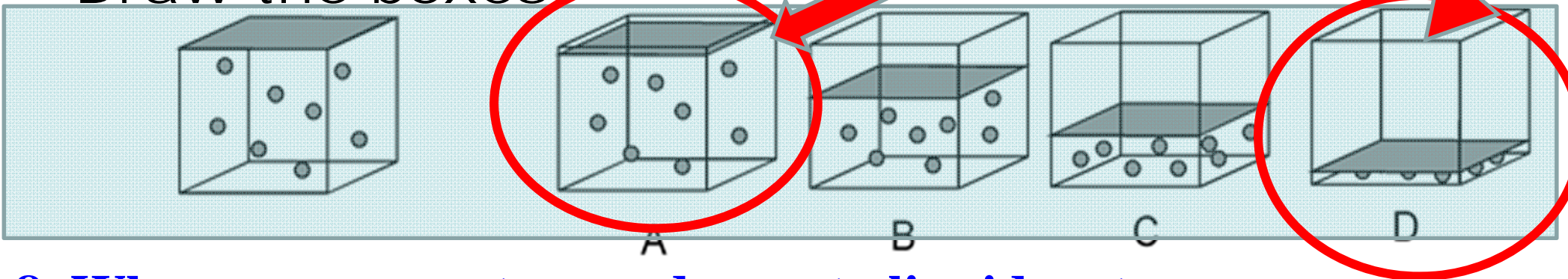
- a. increases
- ☒ b. decreases
- c. remains the same
- d. varies depending on the pressure
- e. varies depending on the volume

Bell Work, Thursday, May 1, 2014



7. The diagram below left shows a representation of a sample of gas at 25°C. Which of the following best represents the same gas at a) 0°C? **A** b) At -250°C? **D**

Draw the boxes



8. When gaseous water condenses to liquid water

- a. particles of hydrogen and oxygen recombine to form H_2O .
- b.** the water releases energy to the surroundings.
- c. the water particles are arranged in an orderly pattern.
- d. the water absorbs energy from the surroundings