**Graphing in Science**

1. Kate placed 100 mL of water in five different pans, placed the pans on a windowsill for a week, and measured how much water evaporated.

a. Draw a graph of her data, shown below, with surface area on the *x*-axis.

b. Is the graph linear or non-linear?

c. What does this tell you?

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2. Examine the graph below, and answer the following questions:



**a.** What is the boiling point of the substance? What is the melting point?

**b.** Which state is present at 30°C?

**c.** How will the substance change if energy is added to the liquid at 20°C?

**Multiple choice**

**1.** Which of the following best describes the particles of a liquid?

**a.** The particles are far apart and moving fast.

**b.** The particles are close together but moving past each other.

**c.** The particles are far apart and moving slowly.

**d.** The particles are closely packed and vibrate in place.

**2.** Boiling points and freezing points are examples of

**a.** chemical properties. **c.** energy.

**b.** physical properties. **d.** matter.

**3.** During which change of state do atoms or molecules become more ordered?

**a.** boiling **c.** melting

**b.** condensation **d.** sublimation

**4.** Which of the following describes what happens as the temperature of a gas in a balloon increases?

**a.** The speed of the particles decreases.

**b.** The volume of the gas increases and the speed of the particles increases.

**c.** The volume decreases.

**d.** The pressure decreases.

**5.** Dew collects on a spider web in the early morning. This is an example of

**a.** condensation. **c.** sublimation.

**b.** evaporation. **d.** melting.

**6.** Which of the following changes of state is exothermic?

**a.** evaporation

**b.** sublimation

**c.** freezing

**d.** melting

**7.** What happens to the volume of a gas inside a piston if the temperature does not change but the pressure is reduced?

**a.** increases

**b.** stays the same

**c.** decreases

**d.** not enough information

**8.** The atoms and molecules in matter

**a.** are attracted to one another.

**b.** are constantly moving.

**c.** move faster at higher temperatures.

**d.** All of the above

Short answer (Complete Sentences)

**9.** Explain why liquid water takes the shape of its container but an ice cube does not.

10. After taking a shower, you notice that small droplets of water cover the mirror.

Explain how this happens. Be sure to describe where the water comes from and the

changes it goes through.

11. At sea level, water boils at 100°C, while methane boils at –161°C. Which of these substances

has a stronger force of attraction between its particles? Explain your reasoning.

12. Explain the difference in meaning for each of the following pairs:

a. Solid and liquid

b. Boyle’s Law and Charles’s Law

c. Evaporation and boiling

d. Melting/freezing

**Vocabulary**

13. In **your own words**, write a definition for each of the following terms.

a. States of Matter

b. Solid

c. Liquid

d. Gas

e. Pressure

f. Boyle’s Law

g. Charles’s Law

h. Change of state

i. Melting

j. Freezing

k. Evaporization

l. Boiling

m. Condensation

n. Sublimation