ESS 100

Water Cycle and Cloud Formation

Practice questions Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Water Cycle

1. What are the three phases (states) of matter?

2. What words are used to describe changes between each of the phases of matter? What does each word mean?

3. Rank the states of matter in order of energy.

4. Describe what water molecules are doing in each state of matter.

5. What phase(s) of matter might we be seeing when we look at clouds? How do you know?

6. What is the name of the process by which water (either solid or liquid) falls from the sky?

7. Briefly describe the process through which water leaves the ocean, goes into the sky, and returns to the ocean (the water cycle). Use the correct vocabulary for the changes in water’s states of matter.

8. What’s another name for water that is a gas?

Pressure Change Causing Temperature Change

1. What happens to the temperature of a gas when it is compressed by stronger pressure? Why?

2. What happens to the temperature of a gas when decreasing pressure allows it to expand? Why?

Cloud formation over a warm part of the ocean:

1. How does water leave the ocean?

2. Why does water rise into the sky?

3. When water rises into the sky, why does it form clouds? In your answer, make sure that you explain the role of changing air pressure and temperature.

4. What ingredients need to be in the air in order for a cloud to form? Why?

5. Some clouds don’t rain or snow. What needs to happen in order for a cloud to produce rain?

Answers:

1. What are the three phases (states) of matter?

 **Solid, liquid, and gas**

2. What words are used to describe changes between each of the phases of matter? What does each word mean?

 **Melt: solid →liquid Freeze: liquid →solid Evaporate: liquid →gas Condense: gas →liquid**

3. Rank the states of matter in order of energy.

 **Gas (most energy), liquid (middle), solid (least energy)**

4. Describe what water molecules are doing in each state of matter.

 **Solid: molecules are touching and locked in place**

 **Liquid: molecules are touching, but moving around**

 **Gas: molecules are flying free, but occasionally bumping into one another**

5. What phase(s) of matter are we seeing when we look at clouds? How do you know?

 **Clouds are either** **Liquid or solid. Water is invisible when it is a gas.**

6. What is the name of the process by which water falls from the sky?

 **Precipitation**

7. Briefly describe the process through which water leaves the ocean, goes into the sky, and returns to the ocean (the water cycle). Use the correct vocabulary for the changes in water’s states of matter.

 **Water evaporates, rises into the air, condenses to form clouds, and then falls back to the ocean as precipitation**.

8. What’s another name for water that is a gas?

 **Water vapor**

Pressure Change Causing Temperature Change

1. What happens to the temperature of a gas when it is compressed by stronger pressure? Why?

 **The gas heats up, because squeezing gives the gas molecules a push and speeds them up (gives them energy).**

2. What happens to the temperature of a gas when decreasing pressure allows it to expand? Why?

 **The gas cools down up, because it uses its own energy to push outward. This means it is losing energy, which causes it to cool down.**

Cloud formation over a warm part of the ocean:

1. How does water leave the ocean?

 **It evaporates**

2. Why does water rise into the sky?

 **The water vapor is part of the warm air near the ocean. Warm air has a low density, so it rises.**

3. When water rises into the sky, why does it form clouds? In your answer, make sure that you explain the role of changing air pressure and temperature.

 **As air rises, it encounters lower pressure.**

 **The lower pressure allows air to expand.**

 **Expansion causes the air to cool.**

 **Cooling causes water vapor in the air to condense.**

4. What ingredients need to be in the air in order for a cloud to form? Why?

 **Water and dust. Clouds are made of water droplets. Water can’t condense unless it has a surface to condense on. Dust provides surfaces for condensation to happen.**

5. Some clouds don’t rain or snow. What needs to happen in order for a cloud to produce rain?

 **The water droplets have to join together until they become big enough to fall.**