Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The Hydrologic Cycle!

Directions: As you read the below description of the hydrologic cycle, create a model that includes arrows showing the direction water flows. Each arrow must be labeled with the name of the process that moves the water from one location to another. When you are done you will have nine arrows with nine processes: precipitation, evaporation, condensation, infiltration, runoff, respiration, transpiration, discharge, and uptake. When all nine processes have been added to your model, use your model to answer the questions on the back of this page.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The hydrologic cycle has no starting or ending point. It should never be drawn as a perfect circle. For example, it should NOT look like this:



As a system receives more energy, the system’s water temperature increases. Usually this energy is coming from the sun. Liquid water changes into a gas called steam and rises. This process is called evaporation. As the water rises, it is losing energy, causing the water temperature to lower. The gas turns back into a liquid and collects in clouds. This is called condensation.

As it cools and continues to condense, water droplets gain mass as they stick to other water molecules. The earth’s gravity pulls the water out of the cloud and it begins to rain (or hail, or snow, or sleet). Rain is called precipitation. When the rain hits the ground, the water can penetrate Earth’s surface and collect below the surface, in Earth’s crust. We call this infiltration.

Eventually, that infiltrated groundwater will make its way to the surface again, usually ending up in a stream. When this happens, it’s called discharge.

Sometimes the ground is too hard for the water to infiltrate or sometimes the ground is full of water and can’t hold more (it’s saturated). When this happens, the water flows downhill as runoff. That water then flows into a street drain, river, stream, lake, or ocean.

When roots of plants suck up water, this is called uptake. (Get it?!? The plant TAKES UP water! I love when science makes sense). The plants sometimes lose water through their leaves. When water evaporates from a plant, it’s called transpiration.

Place one hand over your mouth. Breathe out. You should notice that your breath is moist. When you breathe, which is called respiration, you release water out of your mouth. You are adding water back into the water cycle! Interestingly, the International Space Station can capture the water that was respired by astronauts, recycle it, and turn it into drinkable water. Cool, huh?!? But here’s the kicker, respiration also occurs when an organism releases water through urination or perspiration, which the ISS can also capture and recycle for the astronauts to use for drinking water!

Directions: Use your hydrologic cycle model to answer the following questions:

1. We said that the water cycle is not a perfect circle. This means that when a molecule of water falls to the ground, there are several processes it may experience. For example, it could evaporate again. What are all of the other processes that it may experience after it hits the ground? List them below:

1. From where does the hydrologic cycle receive the majority of its energy?
2. Ice caps and ice sheets are two types of glaciers. Research the difference between the two and explain it here:
3. The hydrologic cycle includes water in its gas, liquid, and solid form. Explain how the hydrologic cycle can turn water from gas to liquid.

1. Explain how the hydrologic cycle can turn water from liquid to gas.
2. Explain how the hydrologic cycle can turn water from liquid to solid.
3. Explain how the hydrologic cycle can turn water from solid to liquid.
4. A type of water reservoir is a water sink. The oceans are the largest water reservoir on Earth. What are three other types of water reservoirs (or water sinks) that are above ground?
5. Sometimes water collects underground. It’s called groundwater. (Go figure!) What is the reservoir that stores water underground? Choose one: aquifer or watershed.