# 1.2 The Water Cycle

## Subject
Earth and Space Sciences

## Objectives
The students will:

- Use a diagram to label and explain the water cycle and its components
- Label the water cycle model with appropriate natural features

## Materials

- *Students for Salmon Journal*
- Art Supplies—crayons, markers, pencils

## Size/Setting/Duration
Entire class/classroom/~30 minutes

## Background
Almost three-quarters of the Earth is covered by water. A small quantity of this water is regarded as fresh water, and only a small amount of the fresh water is available for use by humans. The water cycle is an endless process of water exchange between clouds, land, and oceans, constantly recycling all the water that covers the Earth.

In Whatcom County, water comes from moisture-rich clouds that form over the Pacific Ocean and rise over the Cascade Mountains. The water vapor cools as it rises, condenses, and falls as precipitation in our watersheds. The water can form snow, become trapped in glaciers, or it can form rain and fill our lakes and streams.

## Procedure

1. Introduce the idea that you are going to be studying watersheds. To understand watersheds you first have to know how water moves—the water cycle. The sun drives the water cycle, since water changes forms as temperature changes.

2. Explain that the amount of water that is present on the Earth now is always the same amount. Water is continuously changing form and location. Go through the water cycle with students explaining that a cycle is a circle. Ask students where they think water comes from. Once rain is mentioned, tell them that there are other ways water comes from our atmosphere such as snow and hail. Tell the students that all of these are categorized as **precipitation**.

3. When rain or precipitation falls, it soaks into the ground to recharge (refill)aquifers or runs off the earth to fill up lakes, rivers, and wetlands. When it soaks, or seeps, into the ground, it is called **infiltration**. The top of this zone of water is called groundwater and moves through the watershed in a process called **groundwater flow**.

4. As water sits in one place, such as a lake or wetland, or even pools up on a leaf, it will turn from a liquid state to water vapor when it is heated. This is called **evaporation**.

5. As the water vapor rises, the air gets colder and the water vapor will begin to condense to form clouds. If the air cools even more, the water vapor will condense further and turn back into a liquid or crystal (snow/ice) state. This process is called **condensation**.

6. Upon completion of your discussion, have students fill in *The Water Cycle* worksheet in their *Students for Salmon* Journal.

## Extension:

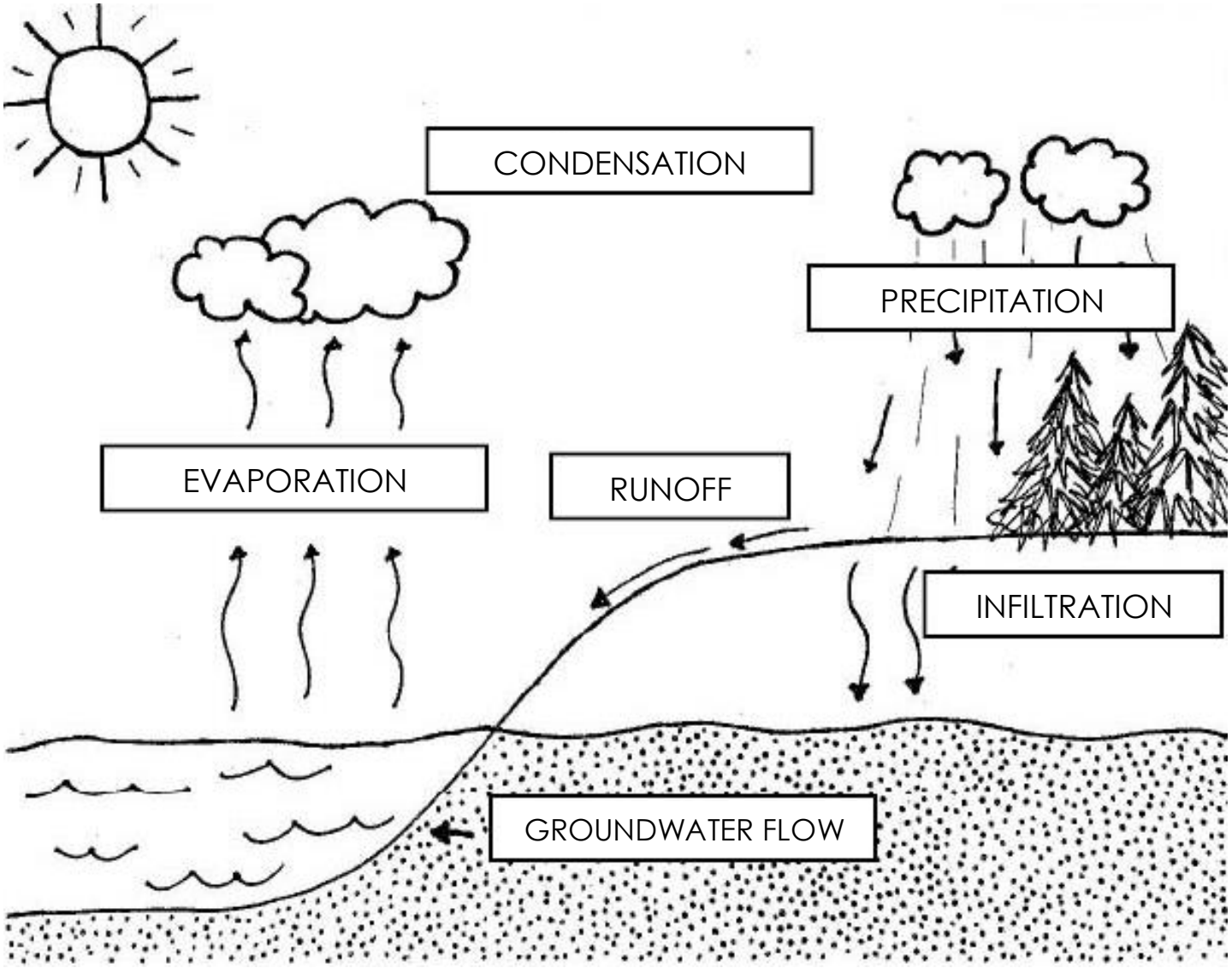
Demonstrate the different states of water for students—solid, liquid, and gas. Melting ice cubes display the change of water from a solid to a liquid. A hot plate with boiling water displays *evaporation* as water changes from liquid to vapor. A cold glass of ice water shows water vapor becoming liquid as the water *condenses* on the side of the glass.

Can students come up with these everyday examples on their own that exhibit processes of the water cycle? An option is to have them design an investigation into the states of water—how can they mimic evaporation? How can they display condensation? And so on.

## Next Generation Science Standards

| **Performance Expectation** | | |
|---|---|---|
| **5-ESS2-1**: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact. | | |
| **Scientific and Engineering Practices** | **Disciplinary Core Ideas** | **Crosscutting Concepts** |
| ▪ Developing and Using Models<br>▪ Constructing Explanations and Designing Solutions | ▪ ESS2.C: The Roles of Water in Earth's Surface Processes | ▪ Patterns<br>▪ Systems and System Models<br>▪ Energy and Matter: Flows, Cycles, and Conservation |

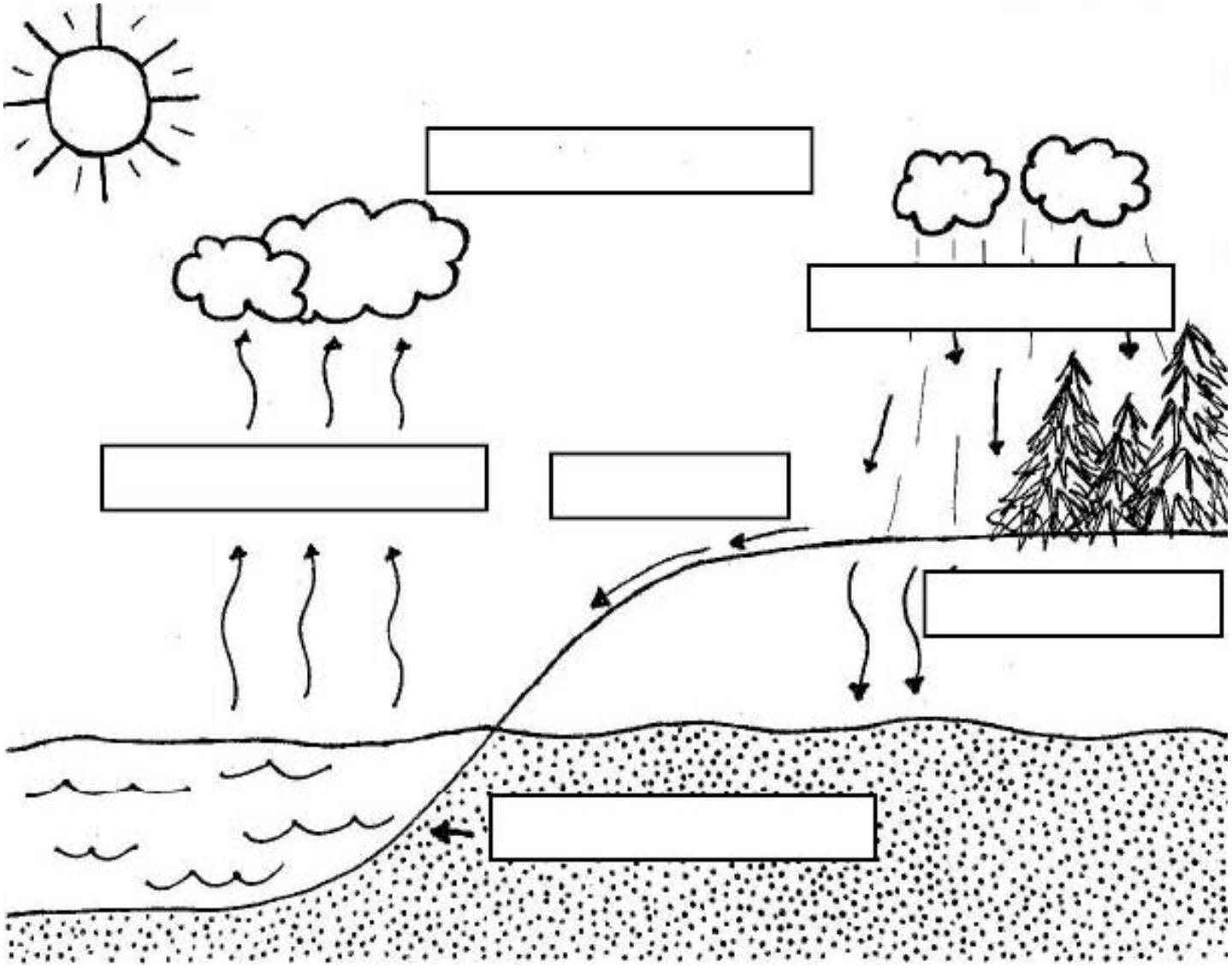
# The Water Cycle - *Answer Key*




1. Evaporation
2. Groundwater Flow
3. Precipitation
4. Runoff
5. Infiltration
6. Condensation
7. Sun/Solar Energy

# The Water Cycle

Fill in the Water Cycle diagram as a class, then answer the questions below!



# The Water Cycle

1. The process when liquid water becomes gas in the atmosphere is called _____.

2. The movement of water underground is called _____.

3. _____ is the water that falls from clouds as rain or snow.

4. Water on the earth's surface which moves into a stream or lake without absorbing into the soil is called _____.

5. _____ is the downward movement of water through the spaces of rock or soil; when surface water becomes groundwater.

6. The process when gas condenses to form clouds is called _____.

7. BONUS QUESTION (not a word from your diagram):
   What type of energy drives the entire water cycle?
   _____