

Teacher Information Sheet (pdf)

Define each concept below and provide a sketch using symbols. For example:

- A yellow circle can represent the sun
- A large flat blue circle can represent an ocean or lake.
- A large flat blue rectangle can represent a river.
- A gray oval can represent a cloud
- A green triangle can represent a tree
- Arrows pointing upward can represent vapor rising
- Arrows pointing downward can represent rain falling
- Small white circles can represent snow
- Small gray circles can represent hail
- A gray square can represent ice

What is a water cycle?

A water cycle is the movement of water from one form to another- liquid, gas, or solid. For example, rain is water in liquid form; vapor or steam is water in gas form, and ice, snow, and hail are water in solid form.

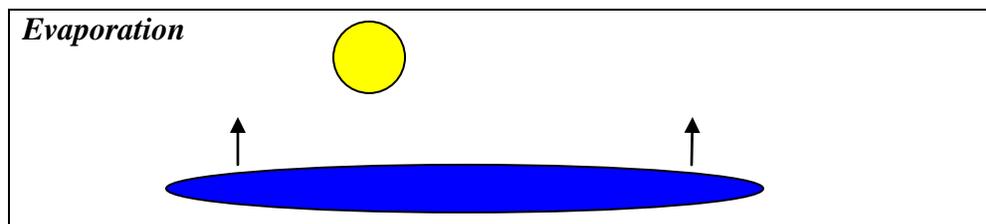
What comes first in the water cycle?

Since the water cycle is a continuous loop, there is no beginning or end. However, we can ask questions that can help guide us to the four stages of the water cycle:

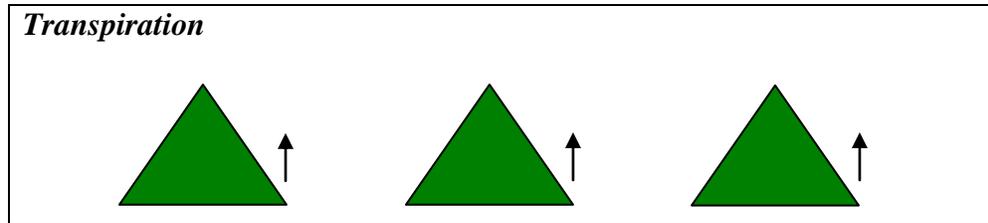
Stage 1: How does water get into Earth's atmosphere?

There are three ways that water gets into Earth's atmosphere:

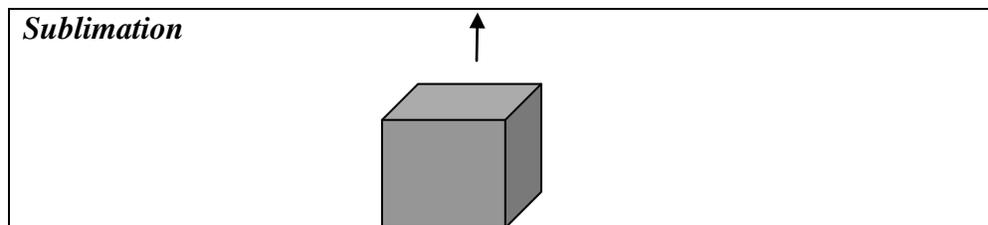
- Evaporation:** The sun heats up the water surface of oceans, seas, lakes, and rivers. When this happens, the water changes from liquid to gas in the form of vapor. An example of this occurs when making tea; steam comes out of the kettle when water is heated. Notice the word *vapor* in *evaporation*. Studies have shown that the oceans, seas, lakes, and rivers provide nearly 90% of the moisture in the atmosphere via evaporation.



- b. Transpiration:** Transpiration is essentially evaporation of water from plant leaves. When plants undergo the process of photosynthesis (see Lesson 2), they release water into the atmosphere. Did you know that we have water vapor in our breaths when we transpire? Note: breathe and transpire are synonyms. For example, when you breathe on a mirror to ‘fog it up’ that’s water vapor from your breath. Transpiration accounts for 10% of the moisture in the atmosphere, however since rainforests have more trees, the percentage of transpiration is much greater in rainforest regions.

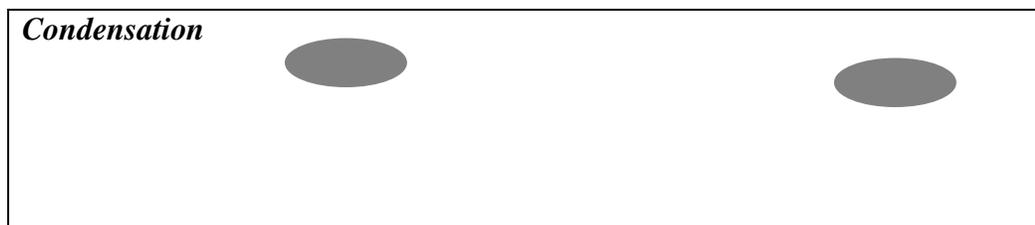


- c. Sublimation:** Sublimation is the process by which water changes from a solid (ice or snow) to a gas, bypassing the liquid phase. Although this process does not occur in rainforests, it does occur in polar and other regions around the world with glaciers, ice, and snow. Remember, the water cycle is a global phenomenon and what occurs in one region can affect another part of the world. This will be discussed later in Activity 3: Fact sheet. Note: Only a very small amount of water vapor enters the atmosphere through sublimation.



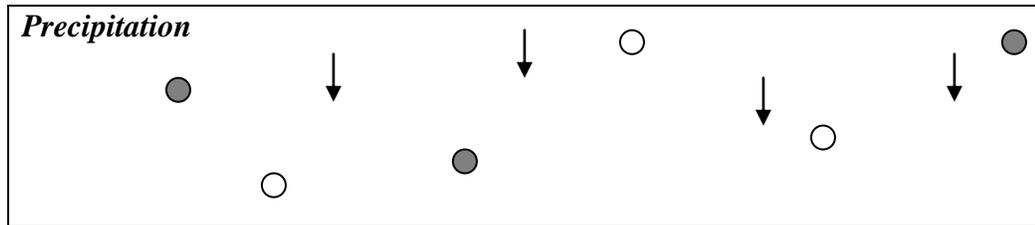
Stage 2: How is water temporarily held and/or stored in Earth’s atmosphere?

Water is held or stored in Earth’s atmosphere in the form of clouds. Clouds form through the process of condensation. Condensation occurs when water vapor (from evaporation) rises into the air where cooler temperatures cause it to condense into clouds.



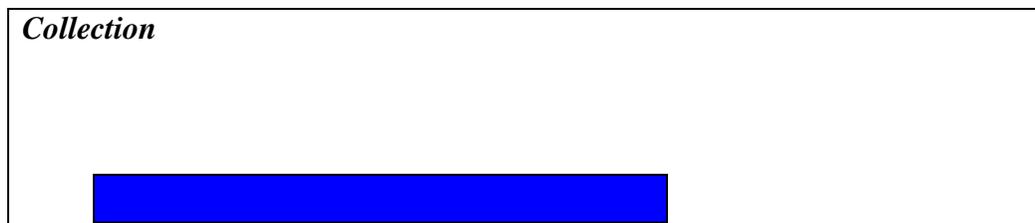
Stage 3: How does water fall from Earth's atmosphere?

Precipitation is water released from clouds in the form of rain, sleet, snow, or hail. It is the primary connection in the water cycle that provides for the delivery of atmospheric water to Earth. Most precipitation falls as rain.



Stage 4: How is water stored or collected on Earth?

Water is collected or stored in the oceans, rivers, lakes, and ponds. It is also stored underground (water table) and in reservoirs. Note: Since only 3% of Earth's water is fresh and all plants and animals depend on freshwater for their survival, it is critical to both conserve and protect all water sources from pollution. Brainstorming ways to conserve water and protect it from pollution will be discussed in Activity 5: Take Action!



References:

<http://ga.water.usgs.gov/edu/watercycle>
www.mongabay.com