

The water cycle

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TOP: Water is the only common substance that can exist naturally as a gas, liquid or solid at the relatively small range of temperatures and pressures found on the Earth's surface. Sometimes, all three states are even present in the same time and place, such as this wintertime eruption of a geyser in Yellowstone National Park. Photo courtesy Neal Herbert/Yellowstone National Park.

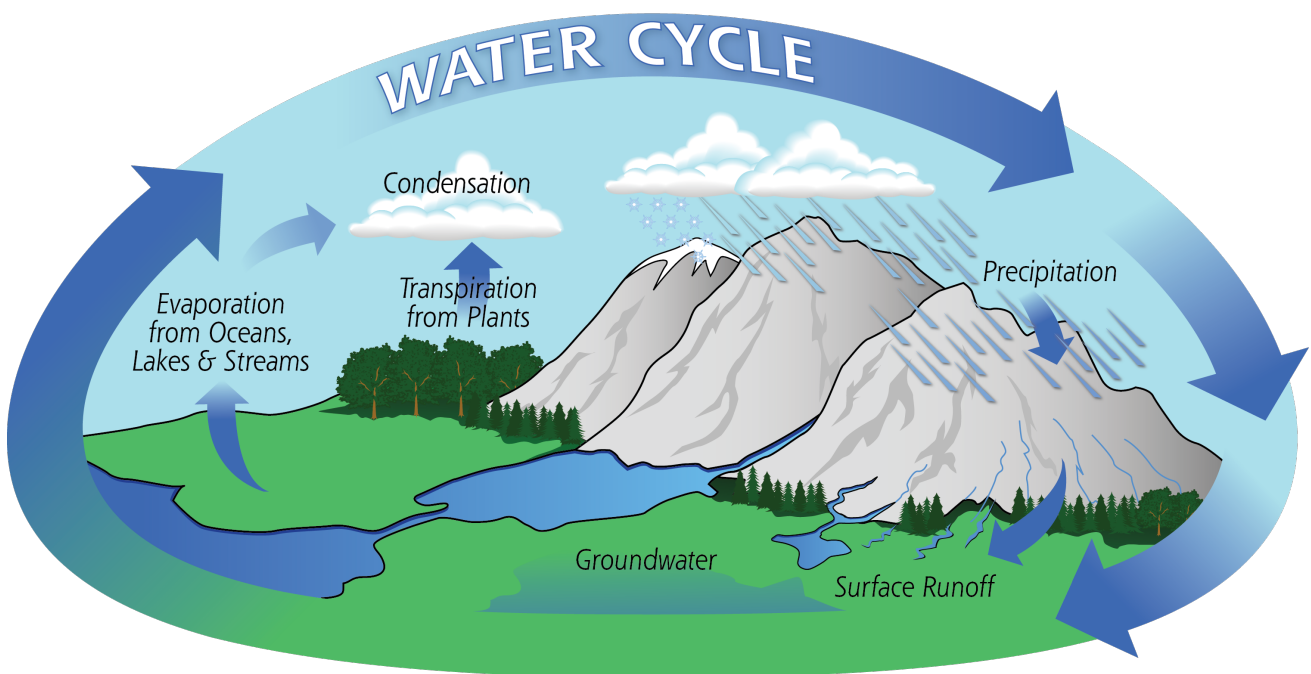
Water covers as much as 75 percent of the Earth's surface. The presence of the oceans makes Earth different from the other planets. Water also appears to be a necessary ingredient for the development of life.

Matter can be found in one of three states: gas, liquid or solid. Increasing or decreasing temperature and pressure can make an object switch from one state to another. Water is special. It can easily be found in any of the three states.

Almost all the water on Earth is in its oceans. A much smaller amount is concentrated in polar ice caps, glaciers and snow. Another small amount is stored in groundwater, lakes, rivers, streams and soil. Only a tiny fraction of the water on Earth exists as water vapor in the atmosphere. Vapor is water that has been heated enough to switch from liquid to gas.

Water Vapor Plays A Big Role On Earth

Despite its small amount, water vapor plays a huge role. By transporting heat around the globe as it moves, vapor drives the Earth's climate. This heat is obtained when water switches from liquid or solid to vapor. The heat is released when water condenses from vapor back to liquid or solid. This results in droplets that fall back to the Earth's surface. The water that falls is called freshwater. It fills up lakes and rivers.



We often talk about the water cycle in order to understand how the Earth's climate works. The water cycle describes how water changes states to move across the planet.

When the sun heats the water on the planet's surface, the water changes from liquid to gas. The change is called evaporation. Through evaporation, the atmosphere receives most of its water. The atmosphere is the air that surrounds the Earth's surface. Alongside evaporation, another way in which water reaches the atmosphere is through plant transpiration. Plants take in water through their roots. Then they release it through small holes called pores, on the underside of their leaves.

How Rain, Snow And Hail Happen

It is also possible for water to change directly from solid to gas. This change is known as sublimation. Evaporation, transpiration and sublimation account for almost all the natural water vapor in the atmosphere.

In the lower atmosphere, rising air currents carry water up where the air is cooler. In the cool air, the water vapor condenses from a gas to a liquid. This results in rain, snow, freezing rain or hail.

Once on the surface, water can take various paths. Some of it evaporates, returning to the atmosphere; some seeps into the ground, or runs off into rivers and streams. Almost all of the water eventually flows into the oceans or other bodies of water. At different stages of the cycle, some of the water is used by humans or other life forms.

Water's Journey From Earth To The Air And Back

Water continually evaporates, condenses and falls back to the surface; in a year, it is as if the entire amount of water in the air were removed and replenished nearly 40 times. Overall, the same amount that evaporates then falls back to the earth. However, more water tends to fall over continents; over the oceans, more water tends to evaporate.

The continued evaporation would eventually leave the oceans empty if they were not replenished. Ocean water is returned largely through runoff from the land areas. Over the past 100 years, oceans have in fact been over-replenished; in one century, the sea level around the globe rose by approximately 17 cm (about 7 inches). One reason is that oceans have been getting warmer; as a result, the water has expanded. On top of this, more water has been entering the ocean due to melting ice sheets and glaciers.

During the complete cycle, water can take many different routes and change states repeatedly. The same water that rained on your great-grandparents' farmhouse years ago might now be falling as snow on your driveway.

Quiz

- 1 Read the sentence from the introduction [paragraphs 1-3].

Water also appears to be a necessary ingredient for the development of life.

Which detail from the article BEST supports the conclusion that the water cycle is important to living things?

- (A) Water covers as much as 75 percent of the Earth's surface.
 - (B) Alongside evaporation, another way in which water reaches the atmosphere is through plant transpiration.
 - (C) At different stages of the cycle, some of the water is used by humans or other life forms.
 - (D) The same water that rained on your great-grandparents' farmhouse years ago might now be falling as snow on your driveway.
- 2 According to the section "Water Vapor Plays A Big Role On Earth," how does the water cycle affect Earth's weather?
- (A) The water cycle causes some places to stay cold and other places to stay warm by keeping water in one place.
 - (B) The water cycle gives the atmosphere most of its water and heat through plant transpiration.
 - (C) The water cycle moves heat and water around the planet by evaporating into vapor and condensing into rain.
 - (D) The water cycle creates cold air around the planet by quickly changing water from a solid to a gas.
- 3 What is the MOST likely reason why the author included the information about rising sea levels in the section "How Rain, Snow And Hail Happen"?
- (A) to explain how water changes between all three states during the water cycle
 - (B) to show how plants are a part of the water cycle
 - (C) to describe what causes sublimation to happen
 - (D) to warn readers that ocean temperatures will be colder because of melting glaciers
- 4 Read the section "Water's Journey From Earth To The Air And Back."
Which paragraph BEST describes how the water cycle works?

