

Think about it

Water cycle

Did you ever wonder where the water goes when it stops raining? After it rains, sometimes you see water on the ground in a puddle. The puddle eventually dries up, but where does the water go? Let's think about the water molecules in the puddle.

Vocabulary

| | |
|--------------|----------|
| evaporation | humidity |
| condensation | exhale |
| water vapor | cycle |

First of all, the water molecules in the puddle are constantly moving. Some of the water molecules at the surface of the puddle may move so fast that they will break away from the other water molecules and go up into the air. These water molecules form an invisible gas called *water vapor*. This process is called *evaporation*. The water vapor mixes in with the rest of the air, and we refer to it as the *humidity* in the air.



Temperature affects the rate of evaporation

Evaporation occurs at any temperature, but it is faster at higher temperatures and slower at lower temperatures. On a warm day, the water warms up and causes the water molecules to move faster than they would on a cold day. The water molecules move and break away faster so the puddle dries up faster. On cooler days, it takes longer for a puddle to evaporate. But temperature isn't the only thing that affects evaporation.

Water evaporates more quickly when the air is dry, and more slowly when the air has more water vapor in it. In some places such as the tropical rain forest, where it rains a lot, the air feels damp and muggy because it contains so much water vapor. Although it's hot in the rain forest, water can stay on the ground for a long time because the air is so humid that the water evaporates slowly.



Temperature affects the rate of condensation

After evaporation, what happens to the water vapor that's in the air? At night, as the sun sets, the air and ground get colder. The invisible water vapor that has evaporated into the air during the day cools down. This causes the molecules in the vapor to move more slowly. When the water molecules in the vapor slow down enough they come together to form tiny droplets of liquid water. This process is called *condensation*. Condensation is also why you can see your breath when you exhale on a cool morning. The gas you exhale contains invisible water vapor. When it hits the cooler air, the water vapor condenses into tiny droplets of liquid water that form a mist you can see.

Think about it *(continued)*

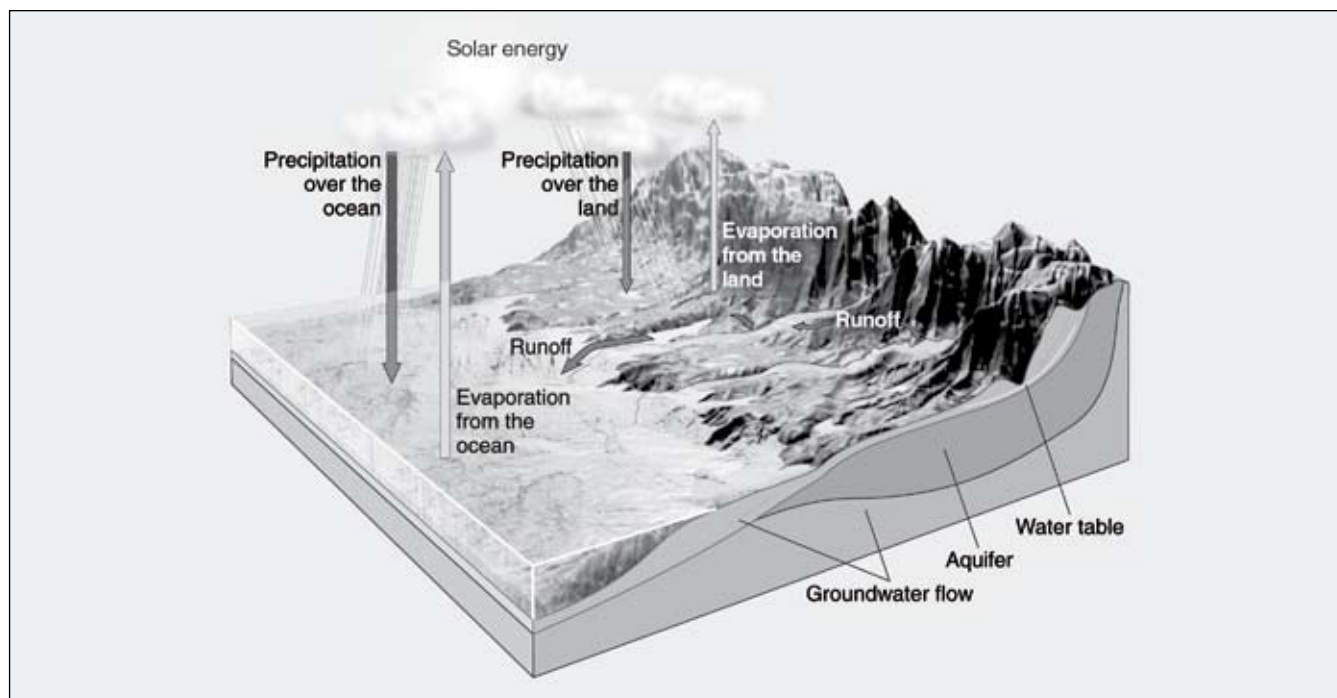
Water and the weather

Depending on the amount of water vapor and the temperature of the air and ground, condensation causes a lot of the different types of moisture that we see. With the right combination of water vapor and temperature, condensed water vapor can form a mist that is visible and close to the ground, called *fog*. Condensation is also the cause of *dew*. Dew is liquid water that has condensed from water vapor and is found on leaves, grass, and other outside surfaces like a car or your bike. When it is really cold outside, the water vapor condenses and then freezes into ice crystals called *frost*.



When water vapor from the air rises into the atmosphere, it cools and condenses into tiny droplets of liquid water that are so light they stay in the air. These hanging droplets are called *clouds*. Eventually, the drops of water get bigger and heavier until they fall to the earth as rain. Sometimes the temperature is so cold in the clouds that the water droplets freeze into ice crystals instead. Depending on the temperature, these solid water crystals can join together to make *snow*, *sleet*, or *hail*.

So, water can change from a liquid to a gas and then back to a liquid or even a solid (ice). Eventually, the water will evaporate again and then condense again in a cycle. This cycle continues over and over and is called the *water cycle*. It cycles from the atmosphere and then back down to the earth in different forms and then back up to the atmosphere again. No matter where water is in the cycle, it is still just plain—but amazing— H_2O .



Think about it (*continued*)

1. Water molecules evaporate from a puddle after a rain storm. In this sentence, what does the word *evaporate* mean?
 - a. Water molecules in the puddle are in the liquid state, and the molecules are not moving.
 - b. Liquid water molecules move fast enough to turn into a gas called water vapor.
 - c. Liquid water molecules slow down and form a solid on the ground called ice.
 - d. Liquid water molecules stay the same speed, neither moving to the air nor staying on the ground.

2. Solid water crystals can form...
 - a. sleet.
 - b. hail.
 - c. snow.
 - d. all of the above.

3. Condensation happens faster if water vapor is...
 - a. heated.
 - b. cooled.
 - c. evaporated.
 - d. in the solid state.

4. Clouds are made by the process of...
 - a. condensation of water vapor in the air.
 - b. cooling ocean water.
 - c. mist evaporating from the ground to form a gas.
 - d. fog and dew found on the ground forming a liquid.

5. The author probably wrote this article in order to...
 - a. tell about the weather patterns over a period of time.
 - b. describe how the clouds are made.
 - c. persuade people to watch the weather channel.
 - d. explain how the water cycle affects weather.

6. Evaporation happens faster if water is...
 - a. cooled.
 - b. vapor.
 - c. heated.
 - d. condensed.

Think about it (*continued*)

7. The water cycle is a very important process for life on Earth. Why is it called a *cycle*.

8. In addition to temperature, what else has an effect on how fast a puddle of water evaporates?

9. Your breath contains water vapor. Why can you sometimes see your breath when it's cold outside?

10. When some people see dew on the ground, they might think that it rained. But dew and rain are different. How does dew form?
