

CLOUD IN A BAG

GRADES K-5

MATERIALS

Ziploc sandwich bags
Soil (potting soil or natural soil)
Newspaper or old tablecloth
Spray bottles
Clear packing tape

BACKGROUND

There will never be any new water here on planet Earth. All of the Earth's water today is the same water that was here 10 days ago, 10 years ago, even at the time of the dinosaurs. That water keeps getting recycled over and over again, in the process known as the water cycle!

Next time you take a shower or bath, consider the water's journey before it got to you. Those same water molecules may have passed through birds, cats, dogs, dinos, bacteria, oceans, lakes, clouds, soil, and more. Water molecules are cleansed and purified as they travel through the water cycle.

The water cycle explains why rain still falls even when we never have new water. Water from lakes and rivers becomes a gas during the process of **evaporation**. As water molecules move and bounce around more quickly, they become water vapor. When the water vapor molecules rise high enough in the sky, they cool and lose energy. The molecules slow down again and become liquid water, a process called **condensation**. This is how clouds are formed. When the droplets of water in a cloud grow and become heavy, they fall as **precipitation**.

Evaporation, condensation, and precipitation are three key steps in the water cycle. Water continually moves through this cycle, so there is never any "brand new" water. This activity allows students to create a cloud in a bag and view the steps of the water cycle in action.

DEFINITIONS

Evaporation - The transformation of water molecules from liquid phase to vapor phase

Condensation - The transformation of water molecules from vapor phase to liquid phase

Precipitation - Water falling from clouds as rain, snow, sleet, or hail

DID YOU KNOW?

Oceans are salty because rivers erode salts and minerals from rocks, and carry these substances into the ocean. The water evaporates as part of the water cycle, but leaves the salt behind. This is also why the Great Salt Lake is salty - streams lead into it, but not out of it, so the salts carried in by the streams have nowhere to go. Fresh water, the water we can drink, makes up less than 3% of the total global water, and much of that is frozen in the form of ice.

TEACHER PREPERATION

Spread out newspapers or tablecloths under the area where students will be assembling their water cycle models. Fill the spray bottles with water.

INSTRUCTIONS

1. Have each student spoon roughly $\frac{1}{2}$ cup of soil into their Ziploc bag.
2. Allow students to spray the soil in the bag with the spray bottle. It should be moist, but not muddy.
3. Ensure all the bags are sealed tightly. Then tape them to a sunny window.
4. Depending on the temperature and amount of sunlight, water will begin condensing in the bag after anywhere from 2-3 hours to the next day. Show the students how a foggy “cloud” is forming inside the bag. When the “cloud” can hold no more moisture, “rain” falls down the sides of the bag.
5. Explain to the students how this same process happens in the environment around us, which is why the water we have now is the same water the dinosaurs had. Review with students the components of the water cycle and ask them to explain each.