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BEFORE AND AFTER THE
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VOCABULARY

LESSON PLAN GUIDE FOR
TEACHERS AND HOME
SCHOOL INSTRUCTORS

DO-IT-YOURSELF
PROJECT



WHAT IS THE WATER CYCLE?

GRADES 3-5

The water cycle, also called the hydrological cycle, is an extremely important cycle that takes place on Earth. We call this the water cycle because “cycle” means a series of events that repeat themselves.

The water cycle is responsible for sustaining life on planet Earth because all life depends on water! The water cycle also helps form landscapes and ties all the water systems together.

Amazingly, the same water you drink could be the same water a Tyrannosaurus Rex drank from. That’s because Earth has been recycling the same water for billions of years!

In simple terms, the water cycle is the continuous movement of water from the ground to the atmosphere. But during this cycle, water undergoes some amazing transformations and actually changes form.

Let’s take a closer look at how the water cycle works...



WHAT IS THE WATER CYCLE?

BEFORE THE VIDEO QUESTIONS

What are the forms of water found on Earth?

ANSWER: Water on earth comes in 3 forms: solid, liquid, and gas.

What happens to a puddle of water on a sunny day?

ANSWER: The sun heats the water, causing it to evaporate and become water vapor. That causes the puddle to dry up. The water vapor then rises up into the atmosphere, where it may condense and eventually fall back down to earth as rain.

Where do clouds come from?

ANSWER: Clouds are the result of water vapor condensing into tiny water droplets. Eventually the droplets get big enough that they fall back down to earth as rain, snow or hail.

Where does rain come from?

ANSWER: Rain comes from evaporated water that has risen into the atmosphere where it condenses into a cloud. That means clouds are made of water! The water droplets eventually get too large and fall to the Earth as rain.

How old is water on earth?

ANSWER: Water on Earth has been here for billions of years! It is constantly being recycled through the water cycle.



WHAT IS THE WATER CYCLE?

AFTER THE VIDEO QUESTIONS

How do we know there is water vapor in the air?

ANSWER: Some evidence that there is water vapor in the air include clouds, feeling moisture on our skin on a humid day, and seeing droplets form on the outside surface of cold drinks (condensation).

What causes water to change from a vapor to a liquid, or a liquid to a solid?

ANSWER: Water changes form in response to changing temperatures. When the temperature becomes colder, water vapor becomes liquid water. When the temperature becomes warmer, liquid water becomes water vapor.

Do you think water become cleaner when it evaporates into a water vapor? Why or Why not?

ANSWER: Yes, generally, water becomes cleaner when it evaporates. Particles in water typically do not evaporate into vapor when water does, so particles are left behind when water vapor rises.

In the quick experiment that Miss Know and Miss Information did, they used the distillation process to demonstrate the water cycle. What happens in the distillation process?

ANSWER: In the distillation process, water is heated until it becomes water vapor. The water vapor rises and enters into a special tube that allows the vapor to cool and become liquid once again.



WHAT IS THE WATER CYCLE?

VOCABULARY

Evaporation - when a liquid turns into a gas.

Condensation - when a gas turns into a liquid.

Water Vapor - water in gas form.

The Water Cycle - the cycle of the water evaporating and condensing on earth. It has been happening for billions of years.

Dew - condensation found on the ground, usually on grass.

Clouds - tiny droplets of condensed water vapor floating high above the ground.

Precipitation - water that falls to the ground. Comes in 3 main forms: rain, snow, and hail.

Distillation - the process of purifying a liquid by heating it until it boils and makes a gas, and then cooling the gas back down into a liquid.

Hydrological/ Hydrology - is the study of movement, distribution, and quality of water throughout the Earth. A person who studies hydrology is called a hydrologist.

Watershed - an area of land where all of the water that is under it, or drains off of it collects into the same place (e.g. a river).



WHAT IS THE WATER CYCLE? LESSON PLAN AND GUIDE

WHAT will students learn?

Students identify the different forms water takes in our world and explore how water changes from one form to another.

Students understand the interrelationships between water cycle processes and the forms of water-**THE WATER CYCLE MODEL ACTIVITY**

Students who demonstrate understanding can:

5-ESS2-1 Developing and Using Models

Create, observe, record and analyze findings and explanations in a water cycle modeling activity

ESS2.A: Earth Materials and Systems

Earth's major systems are the geosphere (solid and molten rock, soil, and sediments), the hydrosphere (water and ice), the atmosphere (air), and the biosphere (living things, including humans). These systems interact in multiple ways to affect Earth's surface materials and processes. The ocean supports a variety of ecosystems and organisms, shapes landforms, and influences climate. Winds and clouds in the atmosphere interact with the landforms to determine patterns of weather.

5-ESS2-1 Systems and System Models

Identify processes in the water cycle. Create water cycle models.

For more on Next Generation Science Standards, please go to:
<https://www.nextgenscience.org>

Duration:

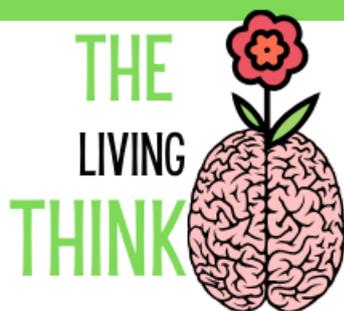
One 50 minute class period

Materials needed per student:

Notebook
Pencil
Markers

Materials needed for instruction:

A large bowl and a smaller bowl
Glass of water
Small amount of grass and dirt
Sheet of plastic wrap, enough to cover large bowl
Big rubber band
A few coins
A sunny window



WHAT IS THE WATER CYCLE? LESSON PLAN AND GUIDE CONT.

Get students THINKING:

Watch **The Living Think WHAT IS THE WATER CYCLE?** video.

Tell the class that they are going to become hydrologists!

Water is found almost everywhere on Earth: from high in the atmosphere (as water vapor) to low in the atmosphere (precipitation, droplets in clouds) to mountain snow caps and glaciers (solid) to running liquid water on the land, ocean, and underground. Energy from the sun and the force of gravity drive the continual cycling of water among these places. Sunlight causes evaporation and propels atmospheric circulation, which transports water around the globe. Gravity causes precipitation to fall from clouds and water to flow downward on the land through watersheds.

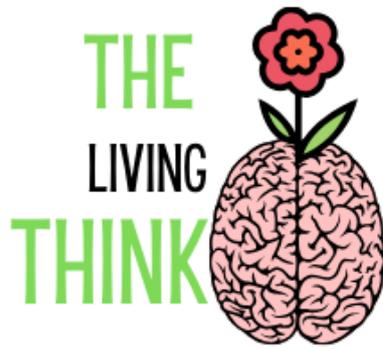
Get students DOING:

Ask students to watch you create a WATER CYCLE BOWL. As you go through the steps, ask the following questions:

What will happen to the water? Will it stay in the same form or change forms? (Why will it change forms? What forms may it take on? (vapor or gas, liquid, solid) What does it take to cause water to change forms? (energy) Where does Do students think the water ever disappears entirely? (no) Why or why not? (because it just changes form, it doesn't go away)

WATER CYCLE BOWL STEPS

1. **Fill the large bowl with water (about 1/2 inch deep).**
2. **Add the grass and dirt.**
3. **Place the smaller bowl in the middle of the big one (should be at least 3x size difference).**
4. **Cover the large bowl with plastic wrap and secure it with the rubber band.**
5. **Place the coins in the center of the plastic wrap so it slants down towards the small bowl.**
6. **Place the bowl outside in the sun for a few hours.**
7. **Tip 1: The more surface area the water has to evaporate, the faster it works.**
8. **Tip 2: If you do not have a hot & sunny day, you can simulate it by using very hot water (teachers and parents only).**



WHAT IS THE WATER CYCLE? LESSON PLAN AND GUIDE, CONT.

Get students REFLECTING:

Student Water Cycle Model - Have students design and draw a depiction of the water cycle processes they have just witnessed and discussed. Their models must include the 3 major processes of the water cycle—evaporation, condensation, and precipitation—and show how those processes are related. Their models must show how water can change form as it moves through those processes and what is driving the process.

WHAT IS THE WATER CYCLE? DIY PROJECT: WATER CYCLE MODEL

Duration: 35 Minutes

Cost: 0 to \$5

Materials needed :

a large metal or plastic bowl
a pitcher or bucket
a sheet of clear plastic wrap
a dry ceramic mug (like a coffee mug)
a long piece of string or large rubber band
water

INSTRUCTIONS:

1. Put the bowl in a sunny place outside.
2. Using the pitcher or bucket, pour water into the bowl until it is about $\frac{1}{4}$ full.
3. Place the mug in the center of the bowl.
4. Be careful not to splash any water into it.
5. Cover the top of the bowl tightly with the plastic wrap.
6. Tie the string around the bowl to hold the plastic wrap in place.
7. Watch the bowl to see what happens.