

Water Cycle Adventure

Grades 4-5

Lesson Summary

Students take an imaginary journey with water in its solid, liquid and gaseous forms to learn about the water cycle.

Overview

In this lesson, students will:

- Identify changes in states of water that enable water to move through the water cycle.
- Describe the water cycle.

Time

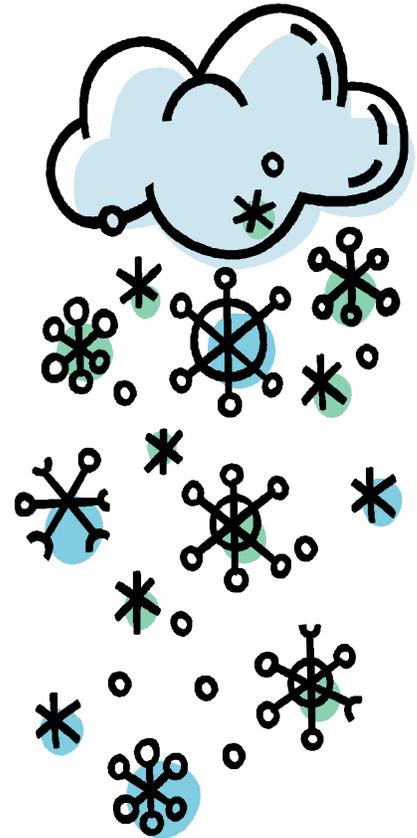
30-45 minutes for lesson

Background

Water can be found almost everywhere at any given time. As it changes forms, it travels throughout the world in the water cycle, which is nature's way of recycling water. If you were to travel with a water molecule, you would explore ocean depths, float through the atmosphere, splash down on a prairie, and weave among soil particles deep underground.

How does water travel to all these places? The processes that drive the water cycle are evaporation, transpiration, condensation, precipitation and accumulation. They are powered by solar energy and gravity. **Evaporation** is when the sun heats up water in soil, plants, oceans, lakes and streams, and turns it into vapor or steam. The water vapor leaves these bodies of water and goes into the air. **Condensation** occurs when water vapor in the air gets cold and changes back into liquid, forming clouds. You can see the same sort of thing occur on the outside of a glass of icy lemonade. Water vapor in the warm air turns back into liquid when it touches the cold glass. **Precipitation** occurs when so much water has condensed that the air cannot hold it anymore. The clouds get heavy and gravity pulls the water back to the earth in the form of rain, hail, sleet or snow. **Accumulation** results when water falls back to Earth as precipitation. It may fall back in the oceans, lakes or rivers or it may end up on land. When water accumulates on land, it will either soak into the earth and become part of the *ground water* that plants and animals use to drink, or it may run over the soil and collect in the oceans, lakes or rivers where the cycle starts all over again.

Since the water cycle has been around since the earth began, it's possible the water in your icy lemonade was once used to bathe Cleopatra or to quench the thirst of a dinosaur!



Vocabulary

- Evaporation
- Condensation
- Precipitation
- Accumulation
- Molecule

Materials

- *Water—River of Life Fact Sheet (gr.3-5)*
- Glass of water
- Chalkboard
- Scratch paper for writing or student notebooks



Preparation

1. Read background information and *Water—The River of Life* Fact Sheet.
2. Casually place a glass of water on your desk or somewhere else that all students can see.
3. Draw a picture on the chalkboard of the sun, a lake, a lakeside with trees and nearby clouds dropping rain.

Procedure

1. Tell students they are going to play a guessing game. Ask students to look around the class for thirty seconds and see if they can name the oldest thing in the classroom. Each student only gets one guess.
2. Call on each student to name his or her answer. Be prepared for them to name YOU as the oldest thing in the classroom!
3. After all answers are given, hold up the glass of water, take a sip and explain that the water you just drank could have been the exact same water that a dinosaur drank millions of years ago. Because water constantly gets recycled through the water cycle, water is the oldest thing in the room.
4. Point to the picture of the sun on the board and explain that this is the beginning of the water cycle. Continue pointing to the relevant images as you explain the following: *As the heat of the sun (solar energy) **evaporates** the water from the lake, this water turns into steam or vapor and floats up into the atmosphere. As these water molecules gather in the air, they **condense** or form into a cloud. When enough water gathers in the cloud, gravity pulls the water down in the form of **precipitation**, also known as rain, snow or sleet. As the rain falls, it **accumulates** or “builds up” in the lake and the ground and is ready to begin the water cycle again.*
5. Make sure students understand what you have just explained and take a few minutes to answer questions if needed.
6. Tell students they are now going to use their imaginations to go on a magical Water Cycle Adventure. Turn down the lights and ask students to sit up straight in their chairs with both feet on the ground. Tell students to close their eyes and quietly take three deep breaths. Slowly ask students to relax their feet, their legs, their bellies, their shoulders, their neck, their face, and their heads, giving them enough time to tune into their bodies and relax each area.
7. Keeping your voice even, level, and clear, read aloud the following script. Pause 2-3 seconds when you encounter the symbol “.....” as this gives students time to imagine what you are describing.

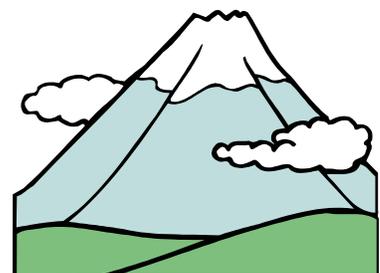


Water Cycle Adventure Script

It is a beautiful summer day.....the sky is blue and you can feel the sun shining warmly.....a songbird sings in a nearby tree.....the ground is warm.....a purple butterfly lands on a nearby flower.....now imagine a still pool of water.....it is a pond surrounded by green grass and tall trees.....you are a tiny water molecule in the pond moving gently back and forth.....you can feel millions of other water molecules around you.....you are all gently moving against each other.....a soft wind ripples the surface of the pool and makes tiny waves.....you are bounced into the other water molecules and you are now at the surface of the pool.....you feel the heat of the sun warming the surface.....you begin to move more rapidly as the warmth and energy of the sun continue to invigorate you.....you become more energized and move more quickly.....suddenly, you burst from the surface and are released into the air.....you have moved away from the others and you gently float alone.....you have just evaporated into water vapor and you are invisible to the human eye.....you are apart from any other water molecules.....

You float in the air and rise slowly.....there is great space around you.....you can see the pond below.....it grows more distant as you continue to rise.....around you, you can see other water molecules, but they are on their own.....you cannot reach out and touch them.....they, like you, continue to float and rise into the atmosphere.....as you rise, it is getting cooler.....your movement becomes slower.....a tiny speck of dust or particle floats by you, and you grab onto it.....another water molecule grabs onto the same particle.....then another.....and another.....you all begin to bond to each other making the particle larger and larger.....you are condensing.....you have become a white, fluffy cloud...you see other particles with water molecules attached and everything around you begins to form patterns.....you have become an ice crystal and the patterns are like giant diamonds.....light passes through these ice crystals and creates tiny rainbows.....as more and more water molecules come together you feel them surround you and join you.....you are becoming heavier.....heavier.....you begin to fall.....

You are a snowflake and you are starting to precipitate..... you fall faster and faster.....a cold wind suddenly blows you up and around.....you swirl and feel as light as a feather.....trees appear.....then a white blanket of snow on a mountain below.....gravity gently pulls you down to the blanket of snow..... above you and around you other particles fall.....you all become part of the white blanket on the mountain..... It is dark and everything becomes quiet and cold.....all around you stillness settles in.....you rest peacefully.....



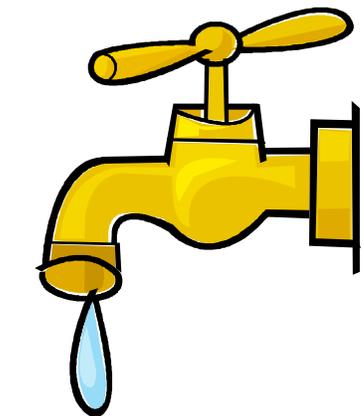
Gently, and ever so slowly, a soft light begins to appear around you.....a gradual brightness grows.....the light brings warmth with it.....you begin to move ever so slowly.....as the light brightens it gets warmer and you begin to melt.....you move back and forth as other water molecules around you begin to slip away.....they seem to move downward, sliding along.....you and surrounding water molecules are suddenly released and begin to slide.....



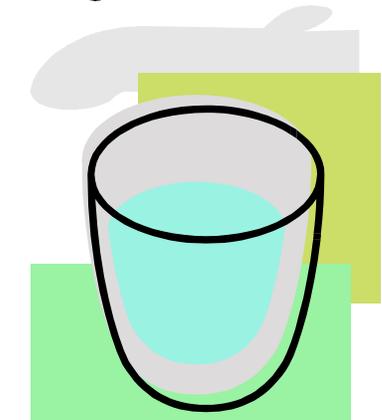
You have become part of a stream and as you tumble downward, you feel other water molecules push together around you..... the sun is bright.....the air is fresh and dryall around you there are water molecules traveling quickly.....you are all moving down a hill.....more groups of molecules join you..... all traveling down hill quickly.....as you travel you see grasses and flowers.....you come upon a large tree.....you gently bump against the roots and slow down.....you stop....you rest....

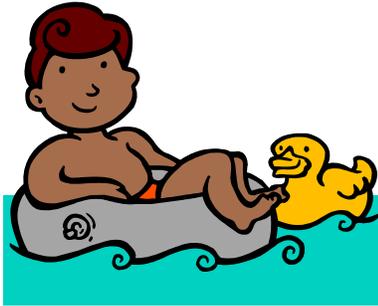
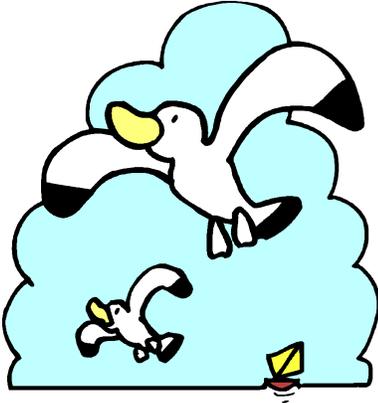


Gravity begins to pull at you and you feel like a magnet stuck to the earth.....you seep into the ground, accumulating among sand and soil particles.....you seep deeper and deeper into the earth.....you are now deep underground, surrounded by soil particles.....suddenly, you find yourself in an underground spring and the pressure of other molecules behind you pushes you forward.....although you are underground you see light up ahead.....there is a hole leading outside and you and surrounding molecules spring out of the ground.....tumbling outside into the bright sunshine, you continue your journey to the foot of the mountain.....



Gradually you slow down.....the land beneath you is getting flatter.....you now move gracefully in a large mass of water..... other streams contribute to your journey.....more and more water molecules collect togetherthis is the big river.....you move slowly as the water flows along for many miles.....things start to change around you.....grassy banks give way to cement canals.....all around you civilization makes itself known.....factories..... cars.....people.....the sounds are loud and constant.....there are many options open to you.....where will you go now?.....the sun's energy may invigorate you, so you could break away and float into the sky again.....other water molecules may hold on to you and you could swirl around the surface of the river.....gravity may pull at you, and you could explore the darkness of the deep sea.....a fish swims byimagine where you will go next.....picture it in your mind.....when you know where you are or where you will go, gently bring your attention back to your feet..... your legs..... your belly..... your shoulders.....your neck..... your head.....and open your eyes...





Discussion

1. After students have “returned” from their adventure, ask them to spend 5-10 minutes writing down their experiences. What did they experience? What did they feel like? What did they see?
2. After students have written freely of their adventure, ask them to list the major parts of the journey and to draw a diagram or drawing illustrating the major parts.
3. Call on several students to share their experiences with the class. Ask them to share their diagrams and explain the major parts. If students aren’t naming the various processes in the water cycle (*evaporation, condensation, etc.*) as it relates to what they are sharing.
4. Ask students to identify the states of water as it moves up through the water cycle (*liquid, steam, vapor, ice, snow, sleet, rain, etc.*) and describe places water goes as it moves through the water cycle (*atmosphere, cloud, lake, river, ground, etc.*)

Extensions

1. Instruct students to look for and record water movements that occur in their daily life: rain, evaporating puddles, a cloud, an animal drinking water, etc.
2. Ask students to create a comic strip of a water molecule traveling through the water cycle. Encourage creativity along with scientific accuracy.

Water Cycle Adventure CA Standards Grade 5



Grade 5

Language Arts ◆ W1.2a	Create multiple-paragraph expository compositions that establish a topic, important ideas, or events in sequence or chronological order.
◆ LS1.2	Interpret a speaker's verbal and nonverbal messages, purposes, and perspectives.
◆ LS1.3	Make inferences or draw conclusions based on an oral report.
Science ◆ 1g	Students know properties of solid, liquid, and gaseous substances, such as water.
◆ 3	Water on Earth moves between the oceans and land through the processes of evaporation and condensation. As a basis for understanding this concept:
◆ 3a	Students know most of Earth's water is present as salt water in oceans, which cover most of Earth's surface.
◆ 3b	Students know when liquid water evaporates, it turns into water vapor in the air and can reappear as a liquid when cooled or as a solid if cooled below the freezing point of water.
◆ 3c	Students know water vapor in the air moves from one place to another and can form fog or clouds, which are tiny droplets of water or ice, and can fall to Earth as rain, hail, sleet, or snow.
◆ 3d	Students know that the amount of fresh water located in rivers, lakes, underground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.
◆ 3e	Students know the origin of the water used by their local communities.

Abbreviations

Language Arts: R=Reading; W=Writing; LC= Language Conventions; LS=Listening/Speaking

Math: N=Number Sense; A=Algebra; MG=Measurement/Geometry; S=Statistics/Data Analysis; MR=Mathematical Reasoning