The Wonderful World of Water

Water Cycle Activity

Overview

Students will learn about states of matter and how water flows through earth's surface and atmosphere

Background

- What forms does water come in?
  - Solid, liquid, gas
- What is a water cycle?
  - The water cycle describes how water **evaporates** from the surface of the earth, rises into the atmosphere, cools and **condenses** into rain or snow in clouds, and falls again to the surface as precipitation. Then starts the process again
  - Evaporation- the process of a liquid turning into a vapor or gas
  - Condensation- the process of a liquid turning into a vapor or gas
- What influences the movement of water?
  - Temperature- the colder the water the slower it goes and vice versa
  - Gravity- gravity helps determine the direction of water (water runs downhill)
  - Obstacles- physical objects may block the path of water
- How is rain/snow made?
  - Water is evaporated from the earth's surface and it condenses in the clouds. When it gets too heavy, gravity pulls it back towards Earth's surface.
- Where does water collect on earth?
  - Clouds, animals, lakes, rivers, oceans, groundwater, soil, glaciers, and plants.
  - Humans are made up of about 60% water.
  - 71% of the earth's surface is covered by water.
- How do animals help in the transportation of water?
  - The animal or human consumes the water and it leaves the body through sweat, respiration, and digestion.
- How do plants help with the movement of water?
  - Plants take up water from the soil and use it to convert nutrients into food. Then the water is evaporated from the leaves when it is exposed to air and sunlight. This is called **transpiration.**
- Is there just one path that water takes during the water cycle? Or are there many places that it can go? Let's find out!

Set up

Label **nine** stations with the included signs (soil, lake, plant, ground water, rivers, animals, ocean, clouds, and glacier). At each station set up corresponding beads with the signs. Each sign should have a container of matching beads (black, blue, green, orange, purple, red, turquoise, white, and yellow). At

each station there should be a corresponding dice. The side that says stay is the station for that dice. For example, if the side that says “stay at cloud” that would be the die for the cloud station. An alternative to the dice is the spinners included with the kit. You only use one set, the dice or the spinners.

Directions

- Explain to the students that they are going to represent water molecules as they move through the earth’s surface and atmosphere.
- Give each student a tag and pipe cleaner
- Attach the tag to one end of the pipe cleaner
- Disperse students among the stations in equal numbers (or close to)
- Students stand in a single line
- When a student reaches the beginning of the line, they collect 1 bead from that station and roll the die (or spin the spinner)
- Whatever the die (spinner) lands on that is where the student will move to next. If they roll (spin) the same station they go to the end of the line at the same station.
    - Example: student starts at plant station and rolls(spins) animal, the student moves to animal station
    - Example: Student starts at cloud and rolls (spins) stay at cloud, the student goes to the end of the line at the same cloud station
- Once student has moved to the next station they may begin the process again.

(All of this may be a timed activity or you may tell the students to collect a certain amount of beads.)

- Once the time has run out or the students have collected their maximum number of beads, the game is over.
- Students may then reflect on how and where they moved through the activity. You can use the activity reflection worksheet and the *Water Cycle Table* to help discussion along. The *Explanation Table* can help guide through the process with explanations for each movement.

Explanation Table

Station	Cube Side Labels	Explanation
Soil	• One side plant • One side river • One side groundwater • Two sides clouds • One side stay	• Water is absorbed by plant roots • The soil is saturated, so water runs off into a river • Water is pulled by gravity; it filters into the soil • Heat energy is added to the water so the water evaporates and goes to the clouds • Water remains on the surface (perhaps in a puddle or adhering to a soil particle)
Plant	• Four sides clouds • Two sides stay	• Water leaves the plant through the process of transpiration • Water is used by the plant and stays in the cells
River	• One side lake • One side groundwater • One side ocean • One side animal • One side clouds • One side stay	• Water flows into a lake • Water is pulled by gravity; it filters into the soil • Water flows into the ocean • An animal drinks water • Heat energy is added to the water, so the water evaporates and goes to the clouds • Water remains in the current of the river
Clouds	• One side soil • One side glacier • One side lake • Two sides ocean • One side stay	• Water condenses and falls on soil • Water condenses and falls as snow onto a glacier • Water condenses and into a lake • Water condenses and falls into the ocean

		• Water remains as a water droplet clinging to a dust particle
Ocean	• Two side clouds • Four sides stay	• Heat energy is added to the water, so the water evaporates and goes to the clouds • Water remains in the ocean
Lake	• One side groundwater • One side animal • One side river • One side clouds • Two sides stay	• Water is pulled by gravity; it filters into the soil • An animal drinks water • Water flows into a river • Heat energy is added to the water; so the water evaporates and goes to the clouds • Water remains within the lake or estuary
Animal	• Two side soil • Three sides clouds • One side stay	• Water is excreted through feces and urine • Water is respired or evaporated from the body • Water is incorporated into the body
Ground Water	• One side river • Two sides lake • Three sides stay	• Water filters into a river • Water filters into a lake • Water stays underground
Glacier	• One side groundwater • One side clouds • One side river • Three sides stay	• Ice melts and water filters into the ground • Ice evaporates and water goes to the clouds (sublimation) • Ice melts and water flows into a river • Ice stays frozen in the glacier

Activity Reflection Worksheet

1. Using the *Water Journey Map*, draw out the path of water as you experienced it, numbering your steps.
2. Now fill in the *Water Cycle Table* to explore how water moves from place to place.
3. Is the water cycle a straight path or are there many different directions and places that water can go? Why?

4. Did you have to repeat a station more than once? Why would water get stuck in one cycle for a long time?

5. Did you stay in the same state the whole time? (liquid, solid, or gas) Why or why not?

6. What influenced your movement as you went around like a water molecule?

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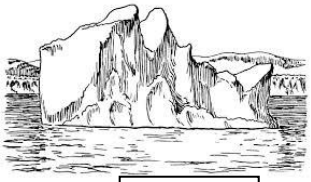
Water Journey Map

Cloud

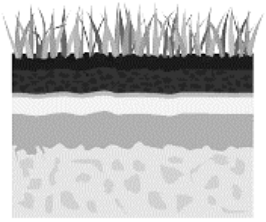


Glacier

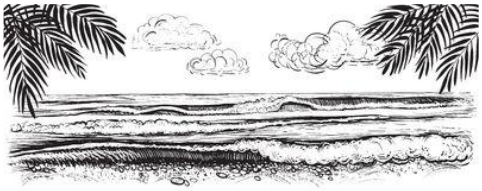
Animal

Lake

River

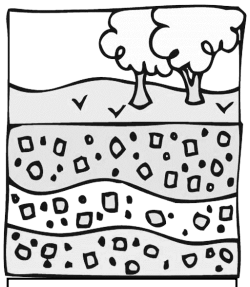


Soil



Ocean

Plant



Ground Water

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Water Cycle Table

Bead	**I started at…**	**…by this process…**	**….I moved to**
Example	*Soil*	*The sun heated water up , so the water evaporated into the clouds*	*Cloud*
