Water On The Move

Strand 6.3: EARTH'S WEATHER PATTERNS AND CLIMATE
All Earth processes are the result of energy flowing and matter cycling within and among the planet's systems. Heat energy from the Sun, transmitted by radiation, is the primary source of energy that affects Earth's weather and drives the water cycle. Uneven heating across Earth's surface causes changes in density, which result in convection currents in water and air, creating patterns of atmospheric and oceanic circulation that determine regional and global climates.

Standard 6.3.1 Develop a model to describe how the cycling of water through Earth's systems is driven by energy from the Sun, gravitational forces, and density.

Phenomenon: *Water is found in all Earth's systems.*

Background Information

This activity requires students to have a basic understanding of the following Science language and processes:

- Condensation occurs when water vapor in the air turns into liquid water, as on the outside of a cold glass of water.
- Evaporation is the opposite of condensation in that liquid water turns into water vapor. How fast water evaporates depends on the amount of water vapor already in the air (humidity), the temperature, the amount of surface area exposed to the air, and air movement over the surface of the water.
- Groundwater is the water beneath Earth's surface, often found in saturated soil and rock. Groundwater supplies wells and springs.
- Water that falls to Earth in the form of rain, snow, hail, or sleet is called precipitation.
- Plants absorb water usually through their roots. This water is eventually evaporated into the atmosphere from the plant surface or leaves. This is called transpiration.
- Water in a gas form is called water vapor.

Pre-Assessment/Invitation to Learn

Brainstorm with the students different places where water is found on Earth. (You may want them to write them in a journal.) Tell them to be very specific (e.g., water falls, humidity, in the soil, groundwater, on leaves, etc.) Go over the words on the work-sheet, "Water on the Move." As these words are defined, tell where the water lists they have brainstormed fit in the vocabulary list.

As a class, fill in the location blanks on the student worksheet below the big picture. Below are the various locations that your class will want to use. Be creative and thing of specific locations in your region. For example, use a particular tree species found in your area for number 3, name a lake or reservoir in your region for number 4, etc. have fun and write specific locations on 2, 3, 4, 5, 6 and 10. Use the general terms listed below for the other locations – 2: waterfall, 3: tree, 4: lake/puddle, 5: river, 6: snowy mountain, 7: groundwater, 8: cloud, 9: ocean, 10: animal, 11: air, and 12: iceberg.

Instructional Procedure

Materials
- ☐ 2 Dice per group
- ☐ Worksheet, "Water on the Move" and "Travel Log"

1. Divide the class into teams of two, and give each team a pair of dice.
2. To play this game:
   - Each player rolls the dice to determine his or her starting location using the Travel Key. This location should be written on #1 of the Travel Log on the worksheet.
   - Each player then takes his or her turn by rolling the dice to determine the new location. The player then records his new location on his Travel Log and tells his teammate how water can move from the previous location to the new location, in addition to writing a description of the movement. A player should use at least one of the words from the "Words to Use" box. For example, if the previous location is tree and the next location is air, a player could say that the water in the tree moves to the air through transpiration when the water is evaporated into the atmosphere from the leaves of the tree.
   - If a player lands on the same location, he or she should roll again until a new location is determined.
   - The game ends when the Travel Log is completely filled in.

Curriculum Extensions

Fine Arts/Visual Arts –

- Have the students get into groups of two. Have them create a three-dimensional model of the water cycle by using supplies they can get from school and home. Label all the components listed below. One student explains the role streams play in the water cycle. The other explains the role clouds play in the water cycle. The model must include all components of the water cycle including condensation, evaporation, mountains, oceans, surface runoff, groundwater, and precipitation. (*Standard III, Objective 2*)

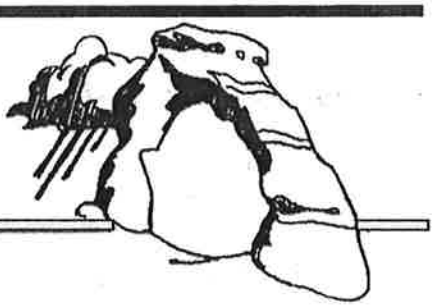
Assessment Suggestions

- Check for students' understanding of the water cycle by reading what they recorded in their Travel Log and verifying their use of water cycle vocabulary.
- Check the students' understanding of the water cycle by listening to their explanations of their 3-D water cycle.

Homework & Family Connections

Have students explain the water cycle to their families. Use any activities from this unit.

Water On the Move



Materials:

Two dice per group
Travel Key and Travel Log (pp. 16-17)

Words to Use:

condensation
groundwater
water cycle
vapor
liquid
evaporation
precipitation
transpiration
temperature

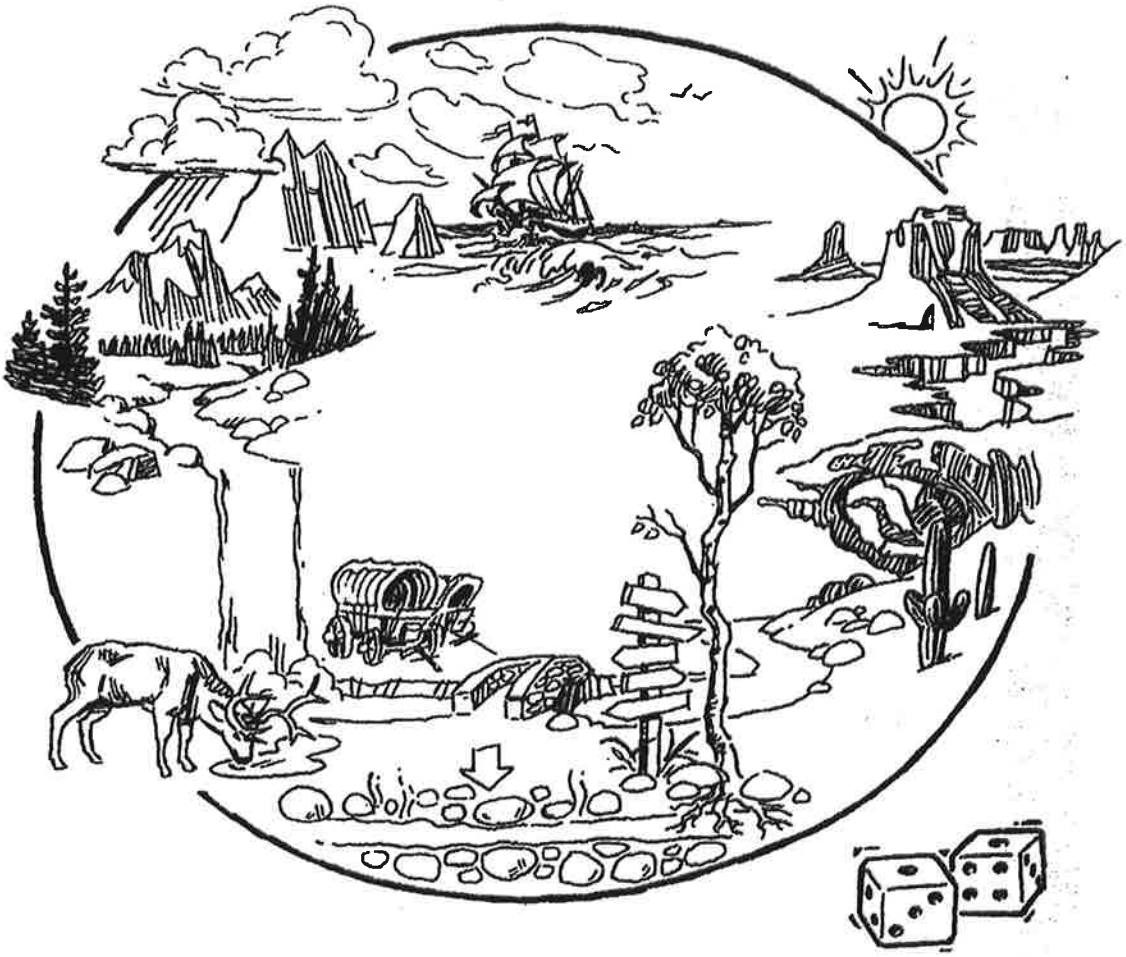
How to Play:

1. Each player rolls the dice to determine his or her starting location using the Travel Key. This location should be written on #1 of your Travel Log.

2. Each player then takes a turn by rolling the dice to determine the new location. Record your new location on the Travel Log and tell a teammate how water can move from the previous location to the new one. You should use at least one of the words from the "Words To Use" box.

3. If you land on the same location, roll again until a new location is determined.

4. The game ends when the Travel Log is completed.



Travel Key:

2: _____	5: _____	9: _____
3: _____	6: _____	10. _____
4: _____	7. groundwater	11: air
	8: cloud	12: iceberg

Travel Log:

1	Location:
2	Location: Description:
3	Location: Description:
4	Location: Description:
5	Location: Description:
6	Location: Description:

Words to Use:
condensation, evaporation, groundwater, precipitation, water cycle, transpiration, vapor, liquid, temperature