

The Incredible Journey

Activity Time: 45 minutes

TEACHERS: Read "Water Cycle Thinking" on page 19 of The Peel Water Story book.

Objectives:

This activity aims to de-simplify students' understanding of the water cycle. Students will investigate the means by which water moves through the hydrologic cycle and the three states of water, via role playing as water droplets.

The students will be able to:

- describe the movement of water within the water cycle
- identify states of water as it moves through the water cycle

Introduction:

While water does circulate from one point or state to another in the water cycle, the paths it can take are variable. From the beginning of time when water first appeared, it has been constant in quantity and continuously in motion. Little has been added or lost over the millennia. The same water molecules have been transferred time and time again from the oceans and land surfaces into the atmosphere by evaporation and dropped to Earth as precipitation and transferred back to the seas by rivers and groundwater. This endless circulation is known as the hydrologic cycle, or simply the water cycle. At any given instant, about five litres out of every 1,000,000 litres is in motion. (*A Primer on Fresh Water, Environment Canada*)

Materials:

- 9 small posters labelling and explaining each of the 9 stations (table below)
- Incredible Journey tracking sheets (Master Copy provided below)
- 9 paper "dice" corresponding with each station (construction template below)

Procedure:

Let students know that in this activity they are going to become water droplets moving through the water cycle. Describe the nine stations that water can move through: *clouds, plants, animals (including humans), rivers, oceans, lakes, groundwater, soil and glaciers* (refer to table below). Provide each student (or pair of students) with an Incredible Journey tracking sheet.

To begin, distribute the students more or less evenly throughout the nine stations. Have them write the name of their starting station (*river, ocean, lake, etc.*) on Line 1 of their tracking sheet. At each station there is a 6-sided die. Each die is distinct, and what appears on each side is outlined in the table below.

On the starting signal, students will roll the die to determine where they (as water droplets) will go next, or stay at the same station. Regardless, each time the die is rolled the name of the station shown on the die is recorded on the next line of their tracking sheet... *even if they continue rolling the same station (IE - ocean... ocean... ocean...) this is important and deliberate.*

Tell the students that each of them will be demonstrating various movements of water from one location to another within the water cycle. Instruct them to think throughout the activity about how, as a water droplet, they are moving from one station (“lake”) to another (“cloud”). The processes that cause these movements are described in the table below. Teachers may or may not make these process descriptions available to students (on station posters), depending on students’ water cycle knowledge and/or desired level of thinking.

The timed game will start and end on a signal. The students continue moving to the stations as directed by the rolling of dice and record the results in order to keep track of their movement through the water cycle. After approximately ten minutes, the signal will end the game.

Debrief:

Wrap up the activity by having the students describe their “incredible journey” using the tracking sheets to sequence their stories. The students should compare the different paths taken during their journeys and understand why these differences occurred.

Enrichment

- a. Do not provide process descriptions at all, and have students describe the processes themselves which caused them to move, as water droplets, from one station to another.
- b. After this activity, provide students with a problem to solve: give them a starting point in the water cycle, and then describe a series of processes only, instructing the students to record which water cycle stations they think they would find themselves at according to the processes.

Source: Adapted from Project WET’s “The Incredible Journey”.

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Address: 10 Peel Centre Drive, Brampton, Ontario L6T 4B9

Information for 9 Dies and Station Posters

| STATION | DIE SIDE LABELS | EXPLANATION |
|----------------|---|--|
| 1. Soil | 1 side plant 1 side river 1 side groundwater 2 sides clouds 1 side soil | -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) |
| 2. Plant | 4 sides clouds 2 sides plant | -Water leaves the plants through the process of transpiration -Water is used by the plant and stays in the cells |
| 3. River | 1 side lake 1 side groundwater 1 side ocean 1 side animal 1 side clouds 1 side river | -Water flows into the lake -Water is pulled by gravity, it filters into the soil -Water flows into the ocean -An animal drinks the water -Heat energy is added to the water, so the water evaporates and goes to the cloud -Water remains in the current of the river |
| 4. Clouds | 1 side soil 1 side glacier 1 side lake 2 sides ocean 1 side clouds | -Water condenses and falls on the soil -Water condenses and falls as snow onto a glacier -Water condenses and falls into a lake -Water condenses and falls into the ocean -Water remains as a water droplet clinging to a dust particle |
| 5. Ocean | 2 sides clouds 4 sides ocean | -Heat energy is added to the water so the water evaporates and goes to the clouds -Water remains in the ocean |
| 6. Lake | 1 side ground water 1 side animal 1 side river 1 side clouds 2 sides lake | -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 |
| 7. Animal | 2 sides soil 3 sides clouds 1 side animal | -Water is excreted through feces and urine -Water is respired or evaporated from the body -Water is incorporated into the body |
| 8. Groundwater | 1 side river 2 sides lake 3 sides groundwater | -Water filters into a river -Water filters into a lake -Waters stays underground |
| 9. Glacier | 1 side groundwater 1 side clouds 1 side river 3 sides glacier | -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 |

PEEL WATER STORY “Incredible Journey” Tracking Sheet



You are a water droplet. In Line 1 below write your starting point for your Incredible Journey. Following each roll of the die, record the location where you find yourself.

| | |
|----|--|
| 1 | |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |
| 9 | |
| 10 | |
| 11 | |
| 12 | |
| 13 | |
| 14 | |
| 15 | |
| 16 | |
| 17 | |
| 18 | |
| 19 | |

