

The Incredible Journey

Activity Overview: In this activity students will role play as water droplets and will move through the water cycle and the three physical states of water

Objectives:

Students will:

- Learn the three states of water – liquid, solid, gas, and how water changes its state
- Gain a better understanding of the water cycle

Materials:

- 9 dice
- 9 pylons with stakes to secure in ground
- 9 small posters to attach to pylons labelling each station

Setup:

- Set up the 9 stations by securing the labelled pylons to the ground:
- (1) soil, (2) plant, (3) river, (4) cloud, (5) ocean, (6) lake, (7) animal, (8) groundwater and (9) glacier (see image below for idea of how far apart to place pylons). Place the appropriate dice at each station.
- **To figure out which dice goes where, look for the handwriting on the top right-hand corner of each side of the dice. There will be a number (1 through 9). Match it with the corresponding number on the back of each pylon (again, 1 through 9). Example: Dice #1 will be placed with pylon #1**

Takedown: Place the 9 dice and 9 pylons back into the bin.

What will I be doing? (Procedure)

Before you start your presentation, check with the teacher or chaperone that the entire group is present and ready to start.

*Remember that **doing** an experiment and **discovering** the answer is more powerful than watching and listening to someone, so try to involve as many children as possible.*

Say: “Welcome to The Incredible Journey. In this activity, we are going to be water droplets that travel through the water cycle. You will see that water moves through plants and animals (including us!) which is why it is so important to keep our lakes and well-water pollution free.”

Say: “In this activity, there are 9 stations that water can move through. These are: clouds, plants, animals (including humans), rivers, oceans, lakes, groundwater, soil and glaciers. Each station has a die to roll. You will start at one station where you will roll the die. Then look at the posters to know where you should go depending on what you rolled. For example, if you are at the river station and you roll the die and it shows “ocean” you will move to the ocean station.”

Distribute the students more or less evenly throughout all of the stations. 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 if they will stay at the same station. They should stay at the same station (but join the back of the line) if they continue rolling the same station that they are already at (i.e., Ocean...ocean...ocean) this is important and deliberate.

As the students are moving around the stations, say: “Each of you are showing the different movements of water from one location to another within the water cycle. While you do the activity, think about how, as a water droplet, you are moving from one station to another.” We will discuss the different moves you have made in a moment.

The students will move through the stations as directed by the rolling of dice. Let the activity run for enough time so that the students have each moved to a few different stations (about 5-10 minutes). Once they have done this, call them in to debrief.

To debrief, have the students compare their journeys through the water cycle and discuss why these differences occurred. Discuss why or how they changed water states, and why some dice had more (or less) options to travel to different stations. Use the table below for explanations. You do not need to go through the entire table, just use examples of stations that the students moved to.

Specifically remind students:

While water circulates from one point to another there are many different paths that it can take. The same molecules are transferred time and time again from the oceans to the atmosphere and all places in between. This continuous cycle of water is known as the hydrologic or water cycle. It is important to keep our lakes and well water pollution-free because this water moves through plants and animals.

REFERENCE INFORMATION FOR STATIONS:

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 (holding as much water as it can) so water runs off into a river - water is pulled down by gravity, it filters into the soil - heat energy is added to the water, so the water evaporates and forms 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 (evaporation of water from plant leaves) - 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 down 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 forms clouds - water remains in the river
4. Clouds	1 side soil 1 side glacier 1 side lake 2 sides ocean 1 side clouds	- water condenses and falls onto the soil - water condenses and falls as snow onto a glacier - water condenses and falls into a lake - water condenses and falls into an ocean - water remains as a water droplet clinging to a dust particle * Condense → changes from gas or vapour to a liquid

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5. Ocean	2 sides clouds 4 sides ocean	- heat energy is added to the water so that the water evaporates and forms clouds - water remains in the ocean
6. Lake	2 sides groundwater 1 side animal 1 side river 1 side clouds 1 side lake	- water is pulled down by gravity, and filters into the soil - an animal drinks the water - water flows into a river - heat energy is added to the water, so the water evaporates and forms clouds - water remains within the lake or estuary
7. Animal	2 sides soil 3 sides clouds 1 side animal	- water is excreted (gotten rid of) through feces and urine - water is respired or evaporated from the body where it can then contribute to the formation of clouds - 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 - water stays underground
9. Glacier	1 side groundwater 1 side cloud 1 side river 3 sides glacier	- ice melts and water filters into the ground - ice evaporates and water goes into the clouds (sublimation) - ice melts and water flows into a river - ice stays frozen in the glacier

