Incredible Journey

(Project WET 2.0 page 155)

Albuquerque Bernalillo County Water Utility Authority

Summary:
Students learn about where water exists on earth. By traveling through the water cycle, they learn about freezing, melting, evaporation, condensation, and precipitation. Side discussions include:

- the difference between weather and climate,
- how pollution can enter the water cycle,
- and how changes in the environment can effect organisms that live there

Grade: Third

Subject Areas: Science, Social Studies

Materials:
Incredible Journey Kit with beads
Journey pages
Pipe cleaners
Pollution papers or real trash

Next Gen Science Standards

LS2.C: Ecosystem Dynamics, Functioning, and Resilience ♣ When the environment changes in ways that affect a place's physical characteristics, temperature, or availability of resources, some organisms survive and reproduce, others move to new locations, yet others move into the transformed environment, and some die.

LS4.D: Biodiversity and Humans ♣ Populations live in a variety of habitats, and change in those habitats affects the organisms living there. (3-LS4-4)

ESS3.B: Natural Hazards ♣ A variety of natural hazards result from natural processes. Humans cannot eliminate natural hazards but can take steps to reduce their impacts. (3-ESS3-1)

ESS2.D: Weather and Climate
Climate describes a range of an area's typical weather conditions and the extent to which those conditions vary over years. (3-ESS2-2)

NM Science Standards and Benchmarks

II.III.II.3.4. Identify how water exists in the air in different forms (e.g., in clouds and fog as tiny droplets; in rain, snow, and hail) and changes from one form to another through various processes, e.g., freezing/condensation, precipitation, evaporation.

III.I.I.3.4. Know that using poisons can reduce the damage to crops caused by rodents, weeds, and insects, but their use may harm other plants, animals, or the environment.

NM Social Studies Standards and Benchmarks
GeoII.II-F.3.1 Identify the characteristics of renewable and nonrenewable resources.
CivIII.III-A.3.2 Describe and give examples of "public good."
Civ III.III-D.3.2 Understands the impact of individual and group decisions on communities in a democratic society.

Incredible Journey

Talking Points:

- Water can be found in many places on earth.
- Explain the water cycle, introduce vocabulary (evaporation, transpiration, infiltration, runoff, precipitation, and condensation.)
- Water is renewable since it doesn't get "used up" when we use water. But when water evaporates here, it doesn't come back down here, so we are depleting NM resources, but not global resources.
- All living things need water to survive (plants, animals, and people)
- A change in the environment, like a temperature change, can affect the availability of water for the organisms that live there (floods, drought)
- Pollution can move through the environment quickly. Once water is contaminated, the pollution will probably all end up in the ocean sooner or later, since all rivers run to the sea. Pollution in water affects the plants and animals that depend on it.
- What are our responsibilities as good citizens to protect the quantity and quality of water? What can we do to reduce our impact on Earth's water system?

Warm Up (15 minutes):

Warm Up: What do you already know about the water cycle? It's not really a "circle," it's a journey.
Go over vocabulary (use the Water Cycle poster if you like): Condensation, Evaporation, (Sublimation), Transpiration, Infiltration, Run Off, Precipitation, Aquifer, Gas, Liquid, and Solid
Explain the activity. Introduce the stations and look at the die in each. How can water move from that station to the stations on the die. Use the vocabulary you just taught when possible.
When we use water, is it all used up? No. The amount of water on earth is not used up, it just moves around. That makes it "renewable." However, in the desert, we CAN use all the water up in an area. That makes water VERY VALUABLE!

Activity Part I (10 minutes):

Explain how students are to use the papers charting their journey. Explain how they are to get a bead at each station. Ask if there are questions. Start the activity. Let them play until many students have about half or more of their pipe cleaner filled. Stop the action.

Activity Part II (10 minutes):

Tell students that someone has polluted the river. Show them the pollution cards. Introduce the concept of storm drains and how oil or pesticides or fertilizers will go to the river. Start the pollution at the river. Give instructions about spreading pollution to everyone in line with them. Instruct students that when they roll *clouds* they leave the pollution behind and the next person must pick it up. If they already have a card, they hand it to the person behind them.

Continue play with pollution cards for 5 minutes or as long as you can. Take a look at where the pollution ended up. It started in river, but all rivers flow to the ocean. The pollution is everywhere, but most is in the oceans. Why does it get stuck there?

Activity Part III (5 minutes)
Stop students again. Discuss how changes in the environment can affect the water there, such as temperatures rising due to global warming, and how this effects the plants and animals that depend on this water supply. Point out how melting glaciers would affect animals like polar bears (remove glacier station), or extreme drought would affect the plants and animals in the Bosque (remove river station). Play for five more minutes.

Wrap Up – How to Conserve and Protect Water (10 minutes):
Ask students to show their bracelets by holding them up. Which colors of beads are the most common? (Ocean and sky because that's where most of the water is) Where did people get stuck? (ocean/sky, groundwater and glacier) Why? (Because the water in ocean/sky makes a loop, and because groundwater and glacier water is moving VERY slowly.)

Ask students about living in a desert. Where would you expect to find most of our water? Is there a lot of river or groundwater based on your observation of the beads?

We have a very dry climate. Does that mean it never rains in the desert? When it rains, we call that weather. It's something that happens from time to time. Climate is an overall picture of our weather. Usually it does not rain. We get about 9 inches of rain a year, but with the drought we get a lot less.

It is important to protect what little water we have. We get our water in Albuquerque from underground which is renewed very slowly (slower than we are using it), and from the river, which is renewable, if we get rain and snow. Conserve water by taking shorter showers, turn water off when it isn't being used, don't pollute the river by leaving trash or dog poop on the ground.

What steps can we take to reduce the impact of natural hazards like floods or drought?

Questions?

Contact Jeff Tuttle

Phone:

505-804-6705

Email:

jtuttle@abcwua.org

Water Utility Authority