

## Educational Activity Packet

### DINOSAUR WATER: EXPLORING THE WATER CYCLE

30 minute in-home science education targeted to early elementary students

#### Big Idea:

The Earth doesn't make any new water. All the water on Earth gets recycled, all around the planet, using a unique Water Cycle.



The same water you drink every day has been here on earth for a very long time --- even before the dinosaurs! The earth simply moves this water around from place to place, all around the globe, using a natural 4-part Water Cycle. At North City Water District, we also move water around from place to place, all around your neighborhood, only we use things like water pipes, water pumps, and water reservoirs to do the job.

#### LEARNING GOALS

- Understand that the water on earth is a finite supply.
- Understand that water comes in different forms "liquid, solid, gas."
- Discover the places water is stored or "hiding" on our planet.
- Explore how water moves from place to place via the 4-part water cycle.

#### REQUIRED MATERIALS

- A warm, sunny day
- A photo of the earth (or a globe)
- A glass of ice water
- A pencil, and crayons or colored pencils
- Worksheets #1, #2, and #3 (Included in this packet)
- Coloring Pages #1, #2, and #3 (Included in this packet)
- Terrarium Instruction Sheet
- Terrarium Kit: pick up this free kit from our drive-through window. Supplies are limited; please call ahead to confirm availability: 206.362.8100. The kit includes:
  - Terrarium Instruction Sheet
  - Plastic or glass container with a lid.
  - Dirt, small rocks, moss or plant matter, seeds if you like.
  - Dinosaur figurine for decoration.

#### Optional:

- A white button-down shirt or old lab coat to make the lesson more fun.
- A magnifying glass to reinforce the "water detective" aspect of the lesson.

## ENGAGE

1. On a day that is warm and sunny (necessary for Steps 4-7), start by showing your child a picture of the Earth, or a globe if you have one. Ask them to describe what they see.
2. Tell them that sometimes the Earth is called the blue planet. Ask them why they think it might be called that.
  - **Hint:** Because over 70% of the Earth's surface is covered with water (in the form of oceans, streams, rivers, and lakes).
  - **Fun Fact:** Water isn't actually blue, but blue colors are easiest for water to reflect, so that's why we see it as blue.
3. Tell them that today, they get to be a "Water Scientist." Explain that scientists are like detectives -- they ask lots of questions and observe things very closely. As a Water Scientist, their first job will be to observe and learn about the earth's water cycle.

**Note:** If you have a big white button up shirt, or old lab coat, consider letting your child dress up like a scientist for fun. And/or if you have a magnifying glass, use that to reinforce being a "Water Scientist."

## EXPLORE

4. Pour a glass of ice water. Ask your "Water Scientist" to watch it closely and describe what they see—right after you pour it. Have them tell you about the size of the ice cubes, how the outside of the glass feels, and the temperature of the water. Have them draw all these things they are seeing on **Worksheet 1**, in the upper left box.
5. Next, take the glass of ice water and **Worksheet 1 & 2** outside (on a warm sunny day). Set the glass on a warm, flat surface (such as a deck, patio table, or sidewalk). Have your child remove an ice cube from the glass, and using the ice cube like a piece of chalk, ask your child to write their name, or draw a picture on the warm surface with the ice cube. Have your child draw what their picture looks like on **Worksheet 2** in the upper box.
6. Take a ten minute break (play on a swing, eat a popsicle, pull some weeds): tell your child some science experiments require time to see the changes.
7. After ten minutes, bring your child back to the glass of water and "ice drawing." Using **Worksheet 1 & 2**, spend the next 10-15 minutes observing what has changed with both items, and completing the worksheets together. Discuss how scientists must look closely to see what has changed.

## EXPLAIN

8. Now it's time to explain to your "Water Scientist" why things have changed. Using the coloring sheets, have your child color them as you talk through the lessons:

a) Using **Coloring Page #1: How Much Water**, share the following facts:

Over 70% of the earth is made up of water. About 70% of you is also made up of water! Every living thing on the earth needs this water.

b) Using **Coloring Page #2: Water Comes in 3 Forms**, share the following facts:

i. Water comes in three forms:

- **Ice** (*like the ice cube in your glass*).
- **Liquid** (*like the water in your glass*).
- **Vapor / Steam** (*vapor is invisible, but it made your glass get wet*).

ii. Temperature makes water transform and change its form. Sun makes water turn from ice to water, and from water to vapor. Cold makes water transform back into ice.

b) Using **Coloring Page #3: Earth's Water Cycle Has 4 Steps**, share the following:

- i. The earth does not make any "new water." Instead, the earth keeps recycling water and moving it around.
- ii. Have your child drink the glass of water and tell them they are drinking water that has been moving around the earth since the dinosaurs!
- iii. How does the earth recycle water? Using a 4-step water cycle. Remember how when the glass of ice water got warm, the ice melted, and drops of water appeared on the outside of the glass? That is one of the 4 steps of the earth's water cycle!

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iv. Here are the four steps of the earth's water cycle:

**I. Evaporation:**

When water changes from liquid to vapor (an invisible gas in the air) or steam (what you see coming off hot soup), it is "evaporating."

The drawing you made using the ice cube disappeared because it "evaporated" from the sun and warm temperature.

Sun and warm temperatures cause water to change its form: from ice to water, and from water to invisible vapor in the air.

**II. Condensation:**

When water vapor is cooled down, it creates drops of water.

This is what happened when you saw drops of water appear on the outside of your glass of ice water after it sat in the sun.

When the invisible water vapor in the air touched the cold glass, it was transformed into drops of water on the outside of the glass.

When the sun evaporates water in a lake, stream, or river, it goes up into the air. When the vapor cools down up in the clouds, it "condenses," or forms drops of rain water.

**III. Precipitation:**

When drops of rain water up in the clouds get too heavy for the clouds to hold them, they fall to the earth as "precipitation," in the form of rain, snow, or hail. What form you see depends on the temperature.

**IV. Collection:**

All of the drops of rain start to collect—on the sides of your house, on the sidewalk in puddles, along the street, and finally into streams, rivers, lakes, oceans... it even goes underground where you can't see it.

***Then the earth's water cycle starts the recycling process all over again!***



## ENRICH

9. As a final experiment, your “Water Scientist” can now create their own Water Cycle in the form of a terrarium. If you picked up a terrarium kit from our drive-through window, you will have everything you need. If you did not, you can gather the materials and follow the instructions provided in the **Terrarium Instructions**.
10. Assemble the terrarium, and place it in a warm sunny window.
11. Mark your calendar to make sure your “Water Scientist” checks on it every day, using the **Terrarium Observation Sheet** to record daily observations. As you and your child observe the terrarium, you can reinforce the water cycle vocabulary: evaporation, condensation, precipitation, collection.



## EVALUATE

12. Reinforce understanding by using the 4 step water cycle words in everyday conversation. In this way, you can help your child remember and appreciate the importance of the earth's natural water cycles, and how water is a finite resource that needs conserved and cared for.
  - a. Observe the weather together and talk about precipitation.
  - b. On a hot day, watch as ice melts or the sun dries them off after a swim and talk about evaporation.
  - c. Take a walk on dewy grass in the morning and talk about condensation.
  - d. Spend a moment watching the clouds and talk about water vapor forming droplets that will later become rain.
  - e. Splash through a puddle, visit a lake, look at Mt. Rainier in the distance and comment on the snow and glaciers. These are all examples of collection.

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At North City Water District, our job is to take care of and deliver high quality drinking water to you. Providing public education and outreach is an important part of our dedication to water. We hope you and your child enjoyed this activity. To learn more about North City Water District and your drinking water, visit:

**[www.northcitywater.org](http://www.northcitywater.org)**

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