

# Water, Water Everywhere – 2<sup>nd</sup> Grade Day Session

## **Purpose:**

- To provide a fun and exciting learning experience.
- To explore aquatic ecosystems, including the living organisms and nonliving surroundings.
- To introduce the water cycle.
- To encourage children to consider the impact, positive and negative, that humans can have on their environment.

## **Science Standards of Learning Addressed:**

1. See specific activity descriptions.

## **Outline:**

Opening (~45 mins) – Welcome, Introductions, Policies and Guidelines  
All the Water in the World

Station Rotations + Lunch (~2.25 hours) –

1. Creek Stompin’
2. Fish Fun
3. You’re a Drip

Large Group (~30 mins) – Running Water

Closing (~30 mins) – Sharing and Review from the Day  
Campfire Story

## **Take Home:**

Outdoor School Brochure

Brethren Woods Summer Brochure

Birdseed and Pinecone Birdfeeder Instructions (Fall Season)

Wildflower Seeds and Planting Guide (Spring Season)

## **Follow-up Activities:**

Activity Sheet

Teacher Evaluation

# All the Water in the World

## Science Standards of Learning Addressed –

1. 2.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
  - observations and predictions are made and questions are formed;
  - conclusions are drawn; and
  - simple physical models are designed and constructed to clarify explanations and show relationships.
2. 2.3 – The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include
  - identification of distinguishing characteristics of solids, liquids, and gases.

**Supplies** – 1 gallon milk container filled with water, 1 small paper cup, 1 film canister, 1 film canister cover, 1 bottle cap, 1 small acorn cap, 1 nickel with 3 drops on it, 1 drop of water, set of water category signs

## Activity –

1. Ask the students: Where does water come from? Where does it go? Will we run out of water?
2. Explain that the gallon jug of water represents all the water on earth.
3. Fill one small paper cup from the jug.
4. Use the paper cup to fill the film canister and the other containers. (The paper cup should still be about 2/3 full.) Invite students to come up and hold each container.
5. Explain that if you divided all the water on earth into eight categories it would represent the eight different types of water on earth.
6. Use the signs to show the types of water on earth and ask students to decide as a group which container represents each type of water.
7. Once they decide, ask a student to come up and hold the sign behind each container.
8. Discuss the final answers as a group and determine why they chose the answers they did. Correct any wrong answers.
9. Explain that water is always moving around and changing forms. Briefly highlight the differences in characteristics between water in solid, liquid, and gaseous forms. The earth neither gains nor loses water; the water just changes form. This means that the same water that was on the planet years ago is still here.
10. Ask students how much of the water on earth can be used by humans? (*approximately 0.3%*) If 99.7% is not usable, where is it? (*oceans, seas, ice, and atmosphere*) Most of what we do use comes from the one drop representing rivers. What happens if we pollute the water we can use?
11. Explain that today we will be learning all about water and the plants and animals that live in and around water like creeks, rivers, and ponds, as well as how water changes into many different forms.

# Creek Stompin'

## Science Standards of Learning Addressed –

1. 2.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
  - observations and predictions are made and questions are formed;
  - observations are differentiated from personal interpretation;
  - observations are repeated to ensure accuracy;
  - conditions that influence a change are identified and inferences are made;
  - conclusions are drawn; and
  - observations and data are communicated.
2. 2.5 – The student will investigate and understand that living things are part of a system. Key concepts include
  - living organisms are interdependent with their living and nonliving surroundings;
  - an animal's habitat includes adequate food, water, shelter or cover, and space; and
  - habitats change over time due to many influences.
3. 2.7 – The student will investigate and understand that weather and seasonal changes affect plants, animals, and their surroundings. Key concepts include
  - effects of weather and seasonal changes on the growth and behavior of living things; and
  - weathering and erosion of land surfaces.
4. 2.8 – The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include
  - plants provide oxygen, homes, and food for many animals; and
  - plants can help reduce erosion.

**Supplies –** Strainers and plastic observation trays

## Background –

Design a creek stompin' experience using activities below that are appropriate for the size of the group, time limit, and area of camp being used. Choose a trail or path along a stream/creek.

## Activity –

1. Explain that the group is going creek stompin', but that doesn't mean they'll get wet! Creek stompin' is similar to a hike, but along the way we'll stop to look around and do some activities. Remind everyone to keep alert!

2. Set some ground rules including staying together as a group and remaining in areas designated by the leader. Ask an adult leader to take up the rear. Please do not allow students to play on any of the cooperation course elements.
3. Possible activities and items of interest:
  - a. Find a place where the group can sit quietly near the water for a few minutes. Ask the group to see if they can spot any wildlife. What do they hear? Where is this water coming from? Where is it going? Are there any signs that animals have been near the stream?
  - b. Discuss with students what they see around the stream/creek. Is the water clear? What would it look like after a rain? Note any signs of weather or erosion of the land surface. What kinds of trees or plants are nearby? How do they affect the stream/creek? Note that plants help to provide oxygen, homes, and food for many animals and also can help to reduce erosion.
  - c. Have students pair up, stand at the edge and look in. What kinds of bugs do they see? Are they on top of the water? Flying? Swimming under the water? Do they see any fish? Are they easy to see?
  - d. Carefully tilt up a few rocks (toward you) and see if they discover anything else. Be sure to stress the importance of gently returning the rocks to their original position. You may want to recruit adults to help with this activity.
  - e. Discuss the needs that animals have for their habitats (food, water, shelter or cover, and space). Have students use their observation skills to predict what kind of animals might be living near or in the stream.
  - f. Use a strainer to scoop up a little debris from the bottom and put it in a plastic observation tray. Examine it with the magnifying glass. Some aquatic creatures are so small they can't be seen without a magnifying glass or microscope. Be sure they return the animals to the water where they found them.
  - g. Discuss with students what they saw. Did they see any water striders? How do they stay on top of the water? Did they see water boatmen? Why are they called water boatmen? Why is it important to return animals to where they found them? Ask them if their observation skills improved as they began to look more carefully.

# Fish Fun

## Science Standards of Learning Addressed –

1. 2.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
  - observations and predictions are made and questions are formed;
  - observations are differentiated from personal interpretation;
  - conclusions are drawn; and
  - observations and data are communicated.
2. 2.5 – The student will investigate and understand that living things are part of a system. Key concepts include
  - living organisms are interdependent with their living and nonliving surroundings;
  - an animal's habitat includes adequate food, water, shelter or cover, and space; and
  - habitats change over time due to many influences.
3. 2.8 – The student will investigate and understand that plants produce oxygen and food, are a source of useful products, and provide benefits in nature. Key concepts include
  - plants provide oxygen, homes, and food for many animals; and
  - plants can help reduce erosion.

**Supplies** – Fish shapes cut from newspaper and colored paper, sheets of newspaper, knife and/or big scissors, plastic containers, clear plastic wrap, strong rubber bands, and fish food

## Activity –

1. Before students arrive, scatter all the paper fish on the other sheet of newspaper and lay it on the ground.
2. Line the students up and ask them to close their eyes. Lead them in a circle around the newspaper. Tell them that on your signal they are to open their eyes and count the number of fish they see. Count to 10 and then tell them to close their eyes again.
3. Ask them how many fish they saw. Let them open their eyes to check out their answers. Did they see any fish besides the colored ones?
4. Talk about camouflage in an aquatic setting. Why do aquatic animals need camouflage? What kinds of camouflage could they use (body shape, body color, plants, deep water, dock, etc.)?
5. Discuss the habitat needs that all animals (including fish) have (adequate food, water, shelter or cover, and space.) Note the plants around the lake and the important role they have in providing oxygen, homes, and food for many animals, as well as helping to reduce erosion.
6. Explain that ecologists and naturalists have to use special equipment to help them to see under the water. Ask students to list some examples.

7. Show students the sample waterscope/pondscope that they will be making and go over the directions.
  - a. Ask adults to help cut the bottom out of the plastic container. (You may also want to do this ahead of time.)
  - b. Stretch clear plastic wrap over the bottom and secure it with a strong rubber band.
  - c. Be sure that students write their names on their scopes with a permanent marker.
8. Allow time for students to make their scopes.
9. Demonstrate how to lower the plastic covered end into the water. Allow students to have time to walk around the pond (in groups with an adult) to try out their scopes. Be sure that students are with an adult at all times. Encourage them to select areas that are easily accessible (don't walk through the weeds, cattails, etc.) This is the only time that students can be closer than 3 steps to the pond.
10. Meet as a group at the dock area and distribute a scoop of fish food to each student. Remind them that this is all the food they will get so they can either use it all at once or a little bit at a time.
11. They may also want to use their scopes by laying on the dock and looking through them. Do this with extreme caution! Only allow a few students on the dock at a time and monitor them very closely!

# You're a Drip

## Science Standards of Learning Addressed –

1. 2.3 – The student will investigate and understand basic properties of solids, liquids, and gases. Key concepts include
  - identification of distinguishing characteristics of solids, liquids, and gases; and
  - changes in phases of matter with the addition or removal of energy.

**Supplies** – Water cycle poster, 5 basic water form signs, cards with other forms of water, ball

## Activity –

1. Tell participants to imagine that they are a drop of water and ask them to think about what could happen to them as a drop of water.
2. Ask the participants: *Where does water go? Where does rain come from? If water always returns to the ocean, why doesn't the ocean fill up? What causes water to move? (primarily energy from the sun-evaporation- or gravity)* Note how the addition or removal of energy triggers changes in the phases of matter.
3. Explain that water generally moves in a cycle called the water cycle. Water in the ocean evaporates as vapor, forms clouds, falls to the earth as rain, runs into rivers, and then flows back to the ocean. Sometimes it moves around the cycle quickly, but other times it changes form and is slowed down by, transformed into, or used by other elements (ground water, animals, ice, plants, lakes, etc.) before it returns to the water cycle. Note some of the distinguishing characteristics of water in its solid, liquid, and gaseous states.
4. Discuss the processes where water transforms from one form to another. Remind the participants that they are a drop of water. Ask them: What would have to you if:
  - You're evaporated? (*You would go to the clouds.*)
  - You roll downhill? (*You would go to the river.*)
  - You're in an apple and get eaten? (*You would go into the animal.*)
  - You soak into the ground? (*You would eventually go to the ocean.*)
  - You fall as snow? (*You would go to the mountain or land.*)
  - You're absorbed in a root? (*You would go into a plant.*)
5. Set the five basic forms of water signs in a circle.
6. Ask five participants to become one of the five basic forms of water and stand by a sign. Give the remaining players one of the cards and ask them to go to the middle of the circle. There may be duplicate forms in the center.
7. At a "movin' on" signal, the outer circle "cycles" and transforms from one form to another around the circle by tossing the ball across the circle to

- another outer circle player. They can toss it to anyone they want or you can have them toss the ball as it would go through the water cycle.
8. If a player in the center catches the ball, the game stops, and the player with the ball chooses an outer circle form to transform into. If the outer circle player that the inner circle player chooses is a water form that the original inside form can't transform into, that player must stay in the center. The group can judge. For example:
    - Plants transpire water through their leaves and into the air as vapor. Plants can choose vapor.
    - Animals exhale vapor from their lungs or water passes through them and the water runs into rivers or oceans. Animals can choose vapor, rivers, or oceans.
    - Ice melts and runs into rivers and oceans. Ice can choose rivers or oceans.
    - Lakes evaporate into the air as vapor or overflow into rivers. Lakes can choose vapor or rivers.
    - Water runs through soil into rivers and oceans or evaporates from puddles into vapor. Soil can choose rivers, oceans, or vapor.
  9. If the same person catches the ball multiple times, have them choose someone else in the inner circle that has not caught the ball yet to decide how to move to the outside of the circle.
  10. At a "big storm" signal everyone changes places.
  11. When most of the players have had a chance to be transformed, end the game and discuss what happened. Were there some water drops that were never transformed out of the center? How many water drops completed the whole cycle? Did some take shortcuts or skip some part of the cycle? Were there outer elements that could not be directly chosen by the players in the middle? (*clouds and rain*)
  12. Explain that there are times when water stays in the same form for a long time before having a chance to be transformed (polar ice cap). Ask participants what they learned about the water cycle and about playing this game together.



# Running Water

## Science Standards of Learning Addressed –

1. 2.1 – The student will demonstrate an understanding of scientific reasoning, logic, and the nature of science by planning and conducting investigations in which
  - observations and predictions are made and questions are formed;
  - observations are differentiated from personal interpretation;
  - conditions that influence a change are identified and inferences are made;
  - conclusions are drawn;
  - observations and data are communicated; and
  - simple physical models are designed and constructed to clarify explanations and show relationships.
2. 2.5 – The student will investigate and understand that living things are part of a system. Key concepts include
  - living organisms are interdependent with their living and nonliving surroundings; and
  - habitats change over time due to many influences.
3. 2.7 – The student will investigate and understand that weather and seasonal changes affect plants, animals, and their surroundings. Key concepts include
  - effects of weather and seasonal changes on the growth and behavior of living things; and
  - weathering and erosion of land surfaces.

**Supplies** – Aluminum foil, squirt bottle with red colored water, several squirt bottles with blue colored water

## Activity –

1. Describe/define a watershed (*region draining into river or ocean: the land area that drains into a particular lake, river, or ocean*) and discuss this concept together.
2. Review some of the bodies of water they have around their town or state.
3. Tell the participants that they are going to build a watershed. Help students get into groups of 6-8 with an adult leader.
4. Each group should work together to mold their foil (using the fists, shoes, rocks, sticks, etc.) into a watershed. Allow time for creativity in building mountains, valleys, ponds, streams, etc.
5. Squirt some of the blue colored water on the uneven aluminum foil. (You may invite some of the other adults to help with this.) Invite groups to notice the water flowing from higher surfaces and collecting on some lower surfaces.
6. Explain that the blue water represents rain. Ask the participants: What do the uneven surfaces of the foil represent? (*the mountains and valleys on*

*earth*) What does the water in the lower spots represent? (*lakes and rivers*)

7. Discuss the pattern the rain creates as it flows down the surface of the earth.
8. Ask the participants: Where does the water that runs off the foil go? (*it soaks into the ground*) Have the adults squirt some water in the air and then ask: Where does the water that is squirted in the air go? (*it becomes part of the atmosphere*) Explain evaporation and ground water.
9. Go around to each group and squirt some red colored water on the "mountain." Point out that the different colors of water mix at some point. Explain that the red colored water represents pollution. Ask: How does pollution on the mountain have an effect on the valley?
10. Discuss with the students ways that they can help reduce the amount of water they use and prevent water pollution.
11. Have students carefully pour any water off of their aluminum foil, smooth it out, and stack it with foil from other groups.