

**FIRST GRADE
NOVEMBER
CHANGES IN WATER**

TOTAL TIME: 45 Minutes (15 minutes per station)

STATION 1: WATER ON EARTH

STATION 2: WASTE WATER TREATMENT SIMULATION

STATION 3: WATER CYCLE

***** DO NOT THROW AWAY THE CUPS, SPOONS, OR BOTTLE. *****

***** ALL ITEMS WILL BE REUSED BY OTHER CLASSES. *****

Materials for "The Earth Water" demonstration

- 2-liter bottle with label removed.
- Water
- Green food coloring
- Salt

- Vegetable oil
- $\frac{1}{4}$ measuring cup
- Book: Saving Water

Materials for "Waste Water Treatment Simulation" demonstration

- One large transparent plastic cup for each child
- One jar to make dirty water
- One plastic spoon per child
- One coffee filter per child
- Rubber Bands

Materials for "The Water Cycle"

- A piece of yarn, leather, or rope.
- Different color beads: light blue, green, yellow, clear, white, dark blue
- Book: Water Cycle by Rebecca Olien or Water Dance by Thomas Locker.

STATION 1

THE EARTH WATER

PLEASE WASH BOTTLE AND RETURN TO BOX WHEN FINISHED.

DEMONSTRATION 1: The Earth Water

Material for "The Earth Water" demonstration

- 2 liter bottle with label removed
- Water
- Green food coloring
- Salt

- Vegetable oil
- $\frac{1}{4}$ measuring cup
- Book: Saving Water

Background:

Water is important to our everyday lives. First graders see water all around them, but many do not realize its importance. Ask students if we can survive longer without food or without water.

They are usually amazed that humans can survive without food much longer than water. Humans can only last about 3 days without water. After that time the kidneys will no longer function, and we will not be able to get rid of the wastes that accumulate in our bodies. Our bodies need fresh, clean water; so polluted or salty water will not help our bodies.

Water is an important commodity to all organisms that live on Earth. Although it appears as if we will never run out of water, only 3% of all of the earth's water is fresh (2/3 is locked up as ice, 1/3 as groundwater, lakes, and atmosphere), 97% is salt water which is unusable by most land organisms' metabolic systems.

The next activity will show the children how little water is on the Earth.

Activity:

1. Put a few drops of green food coloring in the bottom of the plastic bottle.
2. Pour water into the container until just past the base of the neck.
3. Add 2-3 tsp. of salt to the green water. Explain that this water represents ocean water which is salty and cannot be used to drink or water fresh water plants.
4. Slowly pour 60ml of corn oil on top of the salt water in the 2 liter bottle. Explain that the oil represents 3% of the fresh water that is available on Earth.
5. Explain that this is all the fresh water that is available for drinking, plant use, and all of our other fresh water needs.
6. Ask them questions such as why else do you think we need water? Example: Cook, brush teeth, showering, flush toilet, water plants.
7. How do you think we could save water?
8. Read the Saving Water book to the children.

STATION 2

WASTE WATER TREATMENT SIMULATION

PLEASE WASH SPOONS, CUPS AND JAR SO THEY CAN BE REUSED IN EVERY CLASS.

Materials:

- A big transparent plastic cup for each child.
- A jar to make dirty water.
- A plastic spoon per child.
- A coffee filter per child. (This may be thrown away when finished).
- Rubber bands

Background:

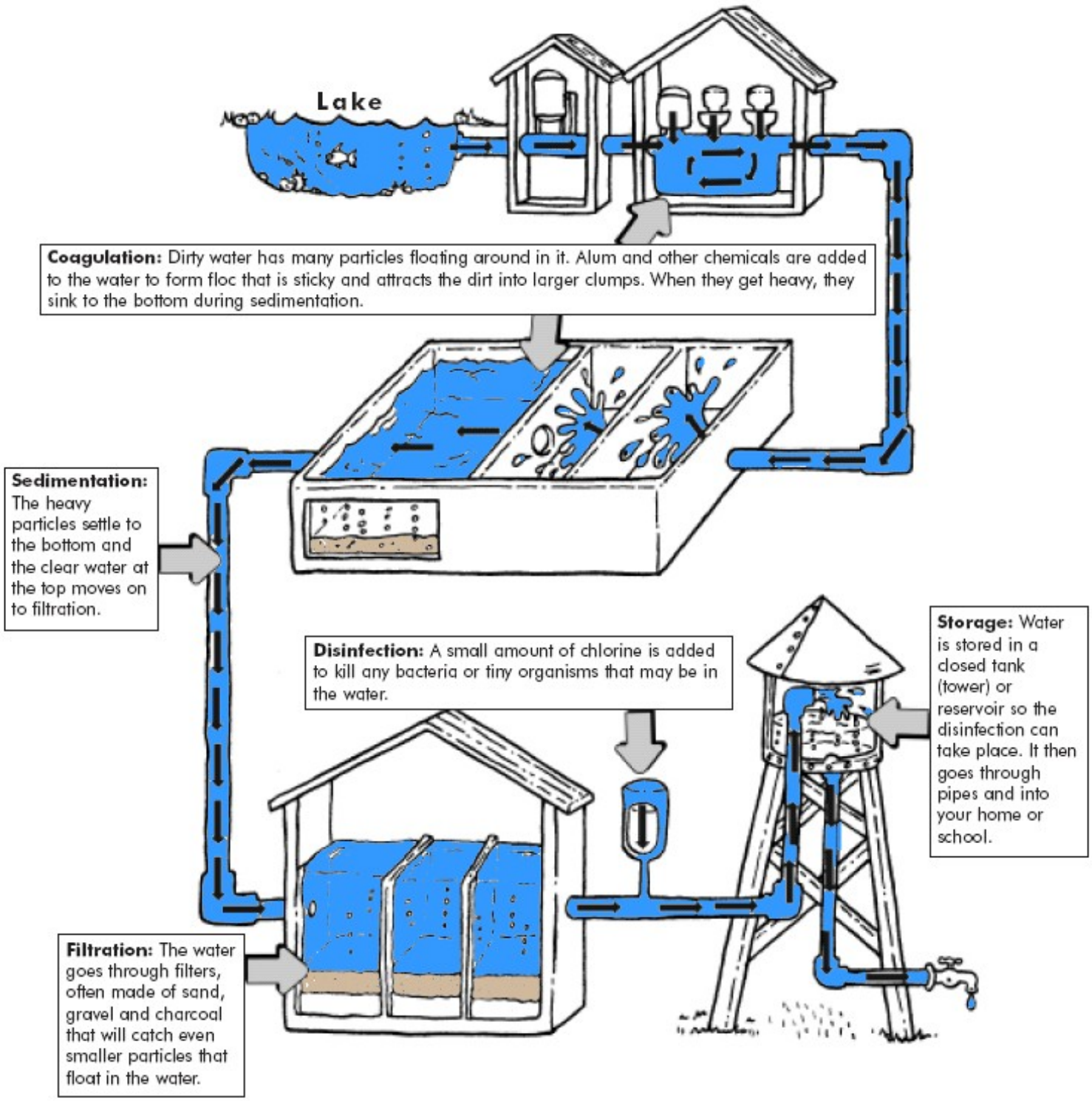
- Humans need clean water to survive. But in some areas there is not enough clean water to serve all the people.
- Methods to clean used water are becoming more widespread. The end product is referred to as "recycled water."
- There are two ways of cleaning water. The first method is a natural method by letting the liquid go through rocks and soils.
- Instead of nature cleaning the water, humans have created factories that accelerate cleaning the water called Wastewater Treatment Plants. They use filtration, chemical additions, disinfection, and microorganisms to clean water.
- All the water that leaves our homes, schools, and businesses goes to a Wastewater Treatment Plant.
- The students will participate in the following activity to observe a simulation of the water treatment process.

Activity: You will clean dirty water but you can not drink it.



- Give each student a big clear plastic cup, one coffee filter, one rubberband, and a spoon.
- You will need to go outside and collect some dirt or make sure you bring a Zip Log bag with 20 spoons of dirt. This is enough for the class.
- Take the big jar and you will create dirty water. Have each child put on spoonful of dirt into the water.
- Stir well to mix.
- Have the children notice how dirty and yucky the water is.
- Then have each child add 1 spoonful of baking powder to the dirty water to help create "floc". The baking soda contains alum which is used in the Water Treatment Plant to create floc. Wait a minute for the heavier particles to settle.
- While waiting explain to the students that the wastewater treatment plant must get the water clean enough to return it to our lakes and reservoirs or storage tanks around the city. Before we can use the water in our homes, it must go to the water treatment plant, then it is stored in tanks around the city or it goes to the reservoirs and lakes. As needed, water from the tanks feeds into underground water pipes that go through the city and to our faucets.
- Place the coffee filter inside the big clear plastic cup and hold it with a rubber band around the edge of the cup.
- Slowly, pour some dirty water into each child's filter and observe how the water comes out cleaner. The water takes a few minutes to go through the filter.
- While waiting show them the laminated poster with the water treatment plant and talk about it.

WATER TREATMENT PLANT



Station 3

THE WATER CYCLE

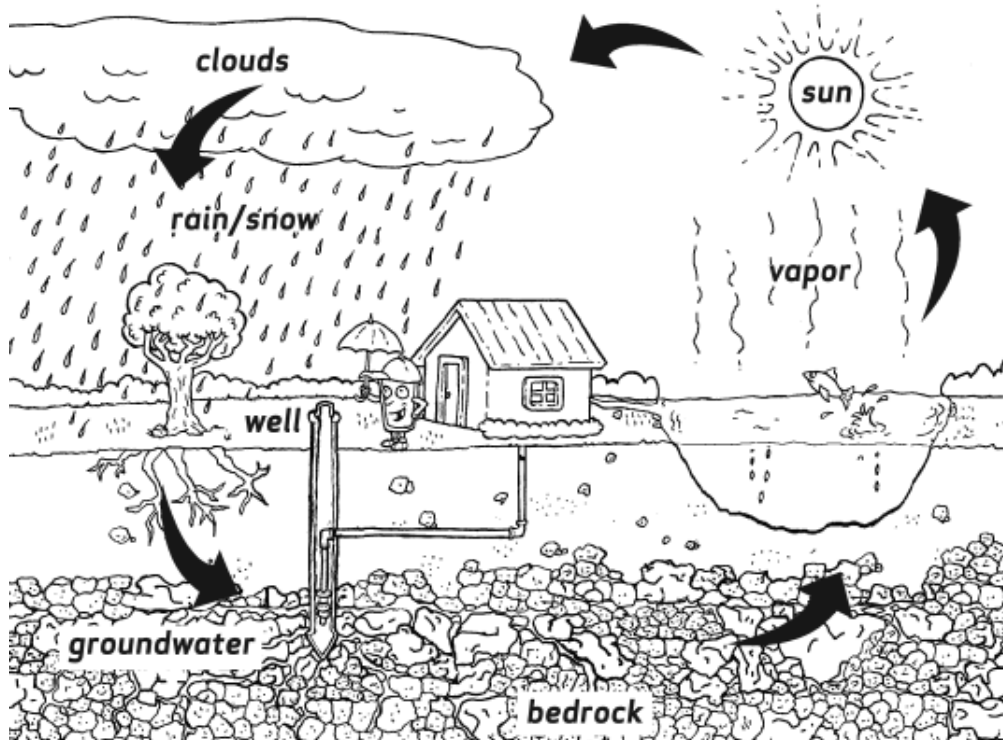
Materials for "The Water Cycle"

- A piece of yarn, leather, or rope.
- Different color beads: light blue, green, yellow, clear, white, dark blue
- Book: Water Dances by Thomas Locker.

This activity uses 6 beads that represent the water cycle. The beads are used to show the paths water takes through its various states - solid, liquid and vapor, as it moves throughout Earth's systems - oceans, atmosphere, ground water, rain, streams, etc.

Activity:

1. Read the book Water Dance by Thomas Locker. This has a great explanation of the water cycle. You can also use the laminated picture below.
2. Give each student a piece of yarn, leather, or rope.
3. Show the students that each colored bead represents a different stage of water in the Earth's systems. The rain (light blue) falls down on the grass (green). It forms puddles (dark blue). The sun (yellow) comes out and dries up or evaporates (clear) the puddles. The air is filled with moisture and this causes a cloud (white) to form. Then the cycle starts all over again.



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