

Environmental Education – First Grade
November 2010

CHANGES IN WATER

Total Time: 45 Minutes (15min per station)

Suggested Volunteers: 3

STATION 1: WATER ON EARTH

Materials:

2-liter bottle with label removed
Green food coloring
Water

Funnel
Salt
Vegetable oil
¼ measuring cup

STATION 2: WATER TREATMENT PLANT IN A CUP

Materials:

Large, clear plastic cups – 1 per student
Coffee filters – 1 per student
Rubber bands – 1 per student
Spoon – 1 per student

Pitcher
Water
Bag of Dirt
Baking Powder

STATION 3: THE WATER CYCLE

Materials:

Yarn or ribbon – approx 1 foot per student to make bracelets
Beads: One of each color per student
light blue, green, yellow, clear, white & dark blue
Book: Water

*****PLEASE USE SOAP TO WASH THE DIRT & OIL FROM ALL SUPPLIES***
SO THEY CAN BE REUSED BY ALL CLASSES**

STATION 1: WATER ON EARTH

Materials:

2-liter bottle with label removed
Green food coloring
Water

Funnel
Salt
Vegetable oil
 $\frac{1}{4}$ measuring cup

Introduction:

Water is important to our everyday lives. We need to drink fresh water to survive. Do you think we can live longer without food or without water? You might be surprised to know that humans can survive for up to 2 weeks without food but we can only last about 3 days without fresh water.

Luckily our planet is full of water, right?

Yes, there's water everywhere! In fact, our planet is covered with more water than land. But did you know that most of the water on Earth is salt water? The oceans cover almost three fourths of our planet.

But what about fresh water?

If you look at all the water on Earth, about 97% of it is salt water. That means only about 3% of the water on Earth is fresh water.

But what does 3% look like? Is that very much?

Let's make a model of all the water on Earth so we can get a better idea of what 3% looks like.



Activity:

Make the Ocean:

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 2-3tsp of salt to the green water and mix.

Add the "Fresh Water":

4. Slowly pour 1/4c (60ml) of vegetable oil on top of the salt water in the bottle.
5. Allow the liquids to settle so the kids can clearly see the layers.

Now you can see that almost all of the water on Earth is salt water and only a very small amount is fresh water. And remember, a lot of the fresh water we do have is not liquid. It's either frozen solid as ice or floating as a gas in the atmosphere as clouds. Our bodies cannot drink salt water and neither can most land plants and animals. That's why fresh water is so important to us. We need it to drink, to cook with, to bathe in, to wash our clothes, to water our crops and lots, lots more!

Discuss:

Can you think of other ways we use fresh water?

How can we conserve fresh water at home, at school, and in our city?

Please clean the bottle and funnel with soap and pack it back in the box for the next class.

Station 2: Water Treatment Plant in a Cup

Materials:

Large, clear plastic cups – 1 per student
Coffee filters – 1 per student
Rubber bands – 1 per student
Spoons – 1 per student

Pitcher
Water
Bag of Dirt
Baking Powder

Introduction:

We cannot drink water that is dirty or polluted. One way to clean water is to filter it. Nature filters water as it soaks down through soil and rock. But this takes a long time and sometimes an area doesn't have enough water for everyone. Scientists have developed new ways to clean water faster than nature can. Cities use big factories called Water Treatment Plants (see the diagram on the next page) to clean the water we use every day.

Now we're going to make our own Water Treatment Plant in a cup.

Activity:

1. Fill the pitcher $\frac{1}{2}$ full with water.
2. Let each student add 1 spoonful of dirt to make dirty water. Mix well and observe how dirty the water looks.
3. Let each student add 1 spoonful of baking powder to the water and mix well. Baking powder contains Alum, which creates floc and makes the dirt clump together. The clumps settle to the bottom and can be filtered out easier.
4. Wait a minute for the heavier particles to settle. Show the students the



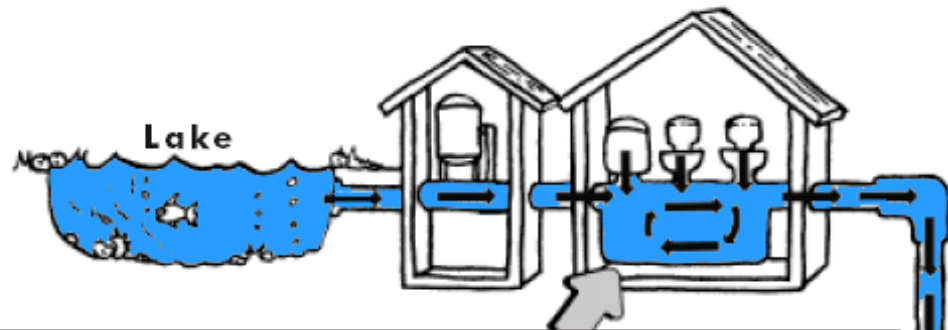
diagram and explain how the treatment plant uses this same technique.

5. Give each student a cup, a coffee filter and a rubber band. Have them place the filter in the cup and secure with the rubber band as shown in the picture.
6. Pour some dirty water into each student's cup and watch as it slowly filters through.
7. Remind the kids that even though

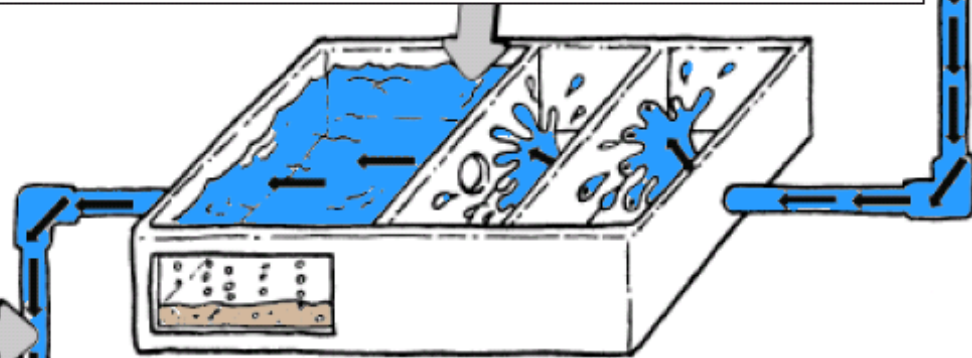
the water looks cleaner, it's still not clean enough to drink. Real Water Treatment Plants add special chemicals, like chlorine, to make sure the water is safe to drink.

Please rinse the pitcher, cups and spoons for the next class to use.

WATER TREATMENT PLANT

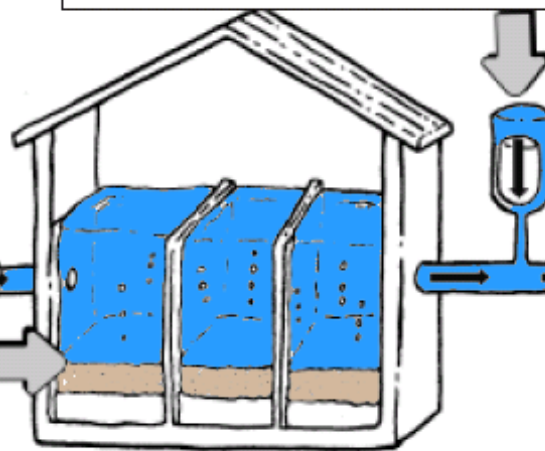


Coagulation: Dirty water has many particles floating around in it. Alum and other chemicals are added to the water to form floc that is sticky and attracts the dirt into larger clumps. When they get heavy, they sink to the bottom during sedimentation.

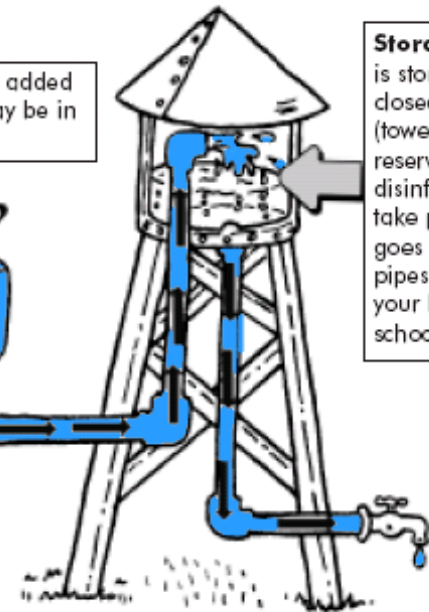


Sedimentation: The heavy particles settle to the bottom and the clear water at the top moves on to filtration.

Disinfection: A small amount of chlorine is added to kill any bacteria or tiny organisms that may be in the water.



Filtration: The water goes through filters, often made of sand, gravel and charcoal that will catch even smaller particles that float in the water.



Storage: Water is stored in a closed tank (tower) or reservoir so the disinfection can take place. It then goes through pipes and into your home or school.

STATION 3: THE WATER CYCLE

Materials:

Yarn or ribbon – approx 1 foot per student to make bracelets

Beads: One of each color per student

light blue, green, yellow, clear, white & dark blue

Book: Water (to read if you finish the station early)

Introduction:

Water is the reason our planet can support life. Without water no plants or animals could live on Earth. Water is also special because it is the only substance on Earth that can be found naturally in all 3 forms; as a liquid, as a solid (ice) and as a gas (steam or water vapor.)

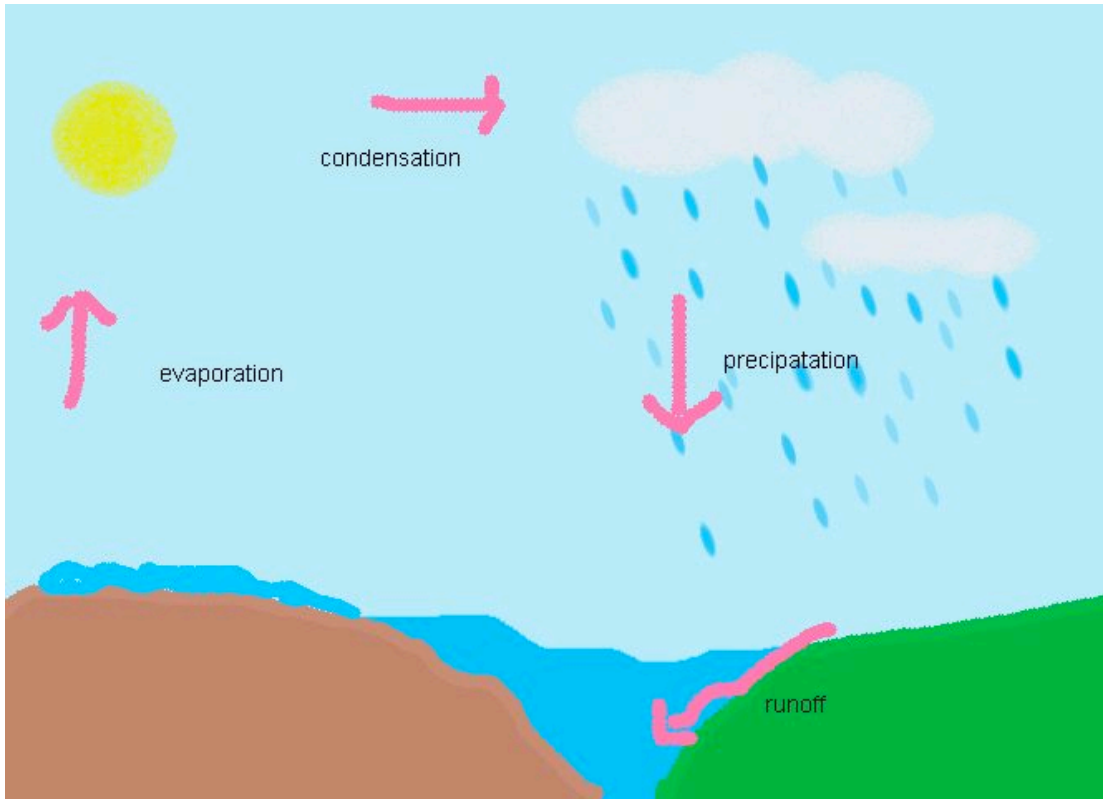
Water is constantly moving around our Earth in a process called The Water Cycle. Using The Water Cycle, our planet has been recycling and reusing it's water for millions of years. In fact, the water you drank today might have been part of the ocean when the dinosaurs roamed the Earth!

Today we're going to make a bracelet as we learn about The Water Cycle. Each bead will represent an important part of the process as we find out more about this amazing process.

Activity:

1. Give each student approximately 1 foot of ribbon or yarn.
2. Have them tie a knot at one end to keep the beads from sliding off.
3. Refer to The Water Cycle diagram as you string the beads together.
 - Water falls from the sky as rain. (Add a light blue bead.)
 - The water falls down on the grass. (Add a green bead.)
 - The water runs down to rivers and oceans. (Add a dark blue bead.)
 - The sun shines on the oceans and warms them. (Add a yellow bead.)
 - The water evaporates into vapor in the air. (Add a clear bead.)
 - The water vapor cools and forms clouds. (Add a white bead.)
 - Water falls from the sky as rain and the cycle begins again. (Tie the ends of the bracelet together to form a circle.)

DIAGRAM OF THE WATER CYCLE



ANOTHER LOOK AT THE WATER CYCLE

