



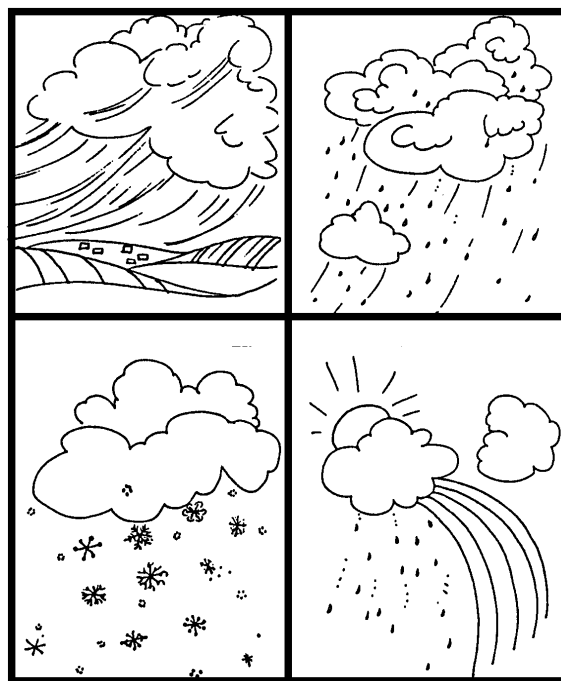
Water Cycle

The Earth's Gift



SECOND GRADE

WATER



1 WEEK
LESSON PLANS AND
ACTIVITIES

WATER CYCLE OVERVIEW OF SECOND GRADE

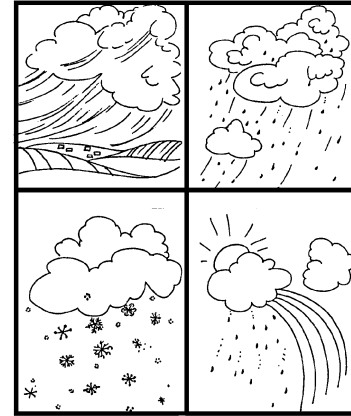
WATER

WEEK 1.

PRE: *Exploring the properties of water.*

LAB: *Experimenting with different soap mixtures.*

POST: *Analyzing the water cycle.*



OCEANS

WEEK 2.

PRE: *Interpreting how water is recycled.*

LAB: *Distinguishing polluted, dirty, and clean water.*

POST: *Comparing solvents and solutes.*

ATMOSPHERE

WEEK 3.

PRE: *Distinguishing air.*

LAB: *Experimenting with air and water.*

POST: *Interpreting why water is important in the atmosphere.*

WEATHER

WEEK 4.

PRE: *Comparing climate and weather.*

LAB: *Exploring how topography influences climate.*

POST: *Discovering the four elements of weather.*

WATER CYCLE - WATER (2)

PRE LAB

Students describe water using a worksheet.

OBJECTIVES:

1. Discovering the water cycle.
2. Exploring the properties of water.

VOCABULARY:

hydrogen
oxygen
water

MATERIALS:

worksheet
glass of water



BACKGROUND:

This activity begins students on a journey to understand the water cycle. Water is a compound composed of the elements hydrogen and oxygen. Water is one of the most abundant, widely distributed, and essential substances on Earth. It occurs in nature as solid (snow, ice), liquid (water), and gas (steam).

Water has no taste, no smell, a pouring sound, no shape, and is wet. You may have to explain that some water does have a taste because many municipal water supplies have been treated with chemicals or may naturally have ions of calcium, magnesium, or fluoride in the water supply and this will give water a slight taste and smell. Distilled water has no taste or smell.

Water is made up of the elements hydrogen and oxygen, which are held together very tightly. The hydrogen and oxygen atoms are arranged similar to Mickey Mouse's head. Mickey's head would be one oxygen, and his ears would each be a hydrogen. Actually, a water molecule is more like a teddy bear, the hydrogen (the ears) are much smaller than the head (oxygen).

PROCEDURE:

1. Give each student a glass of water and have them taste, smell, hear, see, and touch the water. Use the worksheet for students to record their answers. You may want to give students distilled and tap water and see if they can tell the difference. If you come from a different city with a different water supply you may want students to compare.

2. Ask students why water is important. List their answers on the board. The answers should include the following:

IMPORTANCE OF WATER
DRINK TRAVEL (BOAT) GROW (PEOPLE, PLANTS, ANIMALS) WASH HELP IN MANUFACTURING PRODUCTS

3. After you develop and discuss this list with students ask them if we could live without water. No, without water we would die as both a people and a planet. Emphasize that we are referring to fresh water and not salt water.

WHAT IS WATER?

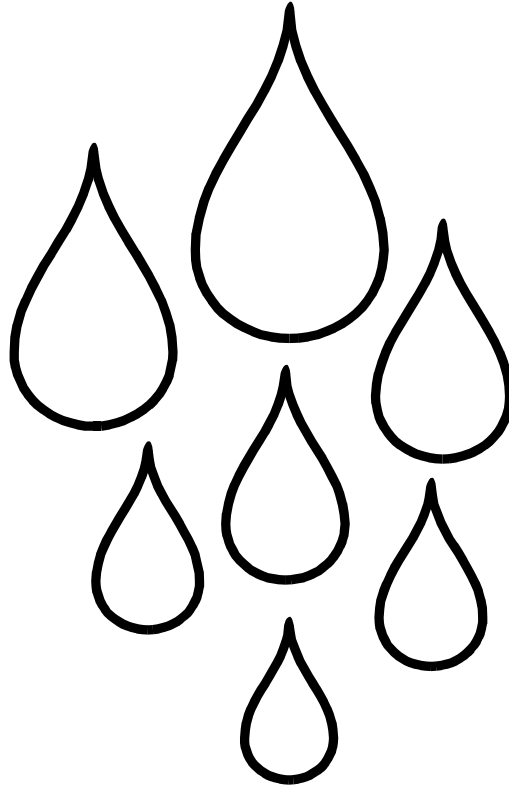
DESCRIBE IT?

smell: _____

feel: _____

color: _____

look: _____



other words that might describe water.

WATER CYCLE - WATER (2)

LAB

Students test which solution makes the best bubbles.

OBJECTIVES:

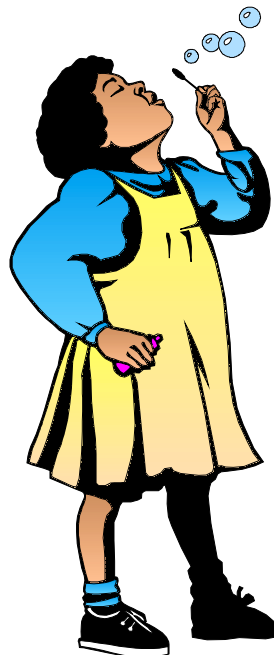
1. Discovering properties of water.
2. Experimenting with different soap mixtures.

VOCABULARY:

surface tension
water

MATERIALS:

bubble trumpets
food coloring
salt
sugar
different dishwashing liquids



BACKGROUND:

The Water Cycle explains interactions between the atmosphere, hydrosphere, and lithosphere. Evaporation of water from the oceans, seas, rivers, and streams into the atmosphere produce precipitation.

Water is a transparent, odorless, tasteless liquid composed of the elements hydrogen and oxygen. It is a very good solvent, meaning that many substances can dissolve in it easily. Water is important to our lives, and without it we could not live. In fact, there are no living creatures that can live without water. Water most probably originated on this planet as gases were being emitted from volcanoes. The Earth's atmosphere captured this water and has continuously recycled it throughout time, in what is called the water cycle. Water evaporates and forms clouds; the clouds provide rain and snow, which is collected in rivers, lakes, underground reservoirs, and oceans that are the source for further evaporation. Water is that perfect substance for the water cycle, because it has a high boiling point and a low freezing point.

Water's surface tension (the ability of a substance to stick to itself) makes it an excellent substance to float heavy objects upon. Water not only sticks to itself, but also to other surfaces, and this allows it to move against gravity, which is very important to plants when transporting water from the soil to their leaves. This upward motion is known as capillarity or capillary movement.

PROCEDURE:

Students in this lab will experience bubbles from different liquids. This is a fun lab for students, but we recommend that you do this activity outside and maybe just before the students go home. Just in case students get a little damp!

1. Each pair of students receives one bubble trumpet or any other instrument that can produce bubbles. Straws also make excellent bubble makers! (We suggest straws if you have to do this activity inside.)

2. Have three buckets, each with a different bubble solution. Students will test different types of solutions, to see which one produces the best bubbles. You should pre-mix the solutions. You may want to put different food coloring in the unknowns for students to easily identify each mixture. We suggest the following mixtures:

unknown #1 = bucket of plain water

unknown #2 = dishwashing liquid + water (equal parts)

unknown #3 = dishwashing liquid + water + a little salt and sugar

3. Before you have the students test the mixtures, we suggest you go over how to make a bubble, especially if you are using bubble trumpets. Hold the trumpet about 2 cm away from lips and direct a small stream of air into the mouthpiece. You are forcing the air from your mouth into the trumpet creating a suction that pulls surrounding air along with it into the trumpet. They do not need to put their mouth on the trumpet, and they do not have to blow hard.

4. Students will discover that plain water does not make bubbles. Plain water has too much surface tension, so it cannot form a bubble. Soap tends to work its way in between the water molecules on the surface of the bubble (between Mickey Mouses ears), thus reducing surface tension and allowing the outside film of water to stretch out, creating a bubble. Remember also that a bubble has two surfaces, inside of the bubble and the outside. This is called a film. Understanding a bubble is more complicated than this, but students in the second grade just have to see the results of varying surface tension. As they will see that not all soapy liquids are the same.

5. Students should experiment with the different mixtures to find out which mixture will make the better bubble. The mixture with dishwashing detergent and salt and sugar should be superior. You may have to experiment yourself with the mixture before you let the students at them. Instead of the above mixtures you may want to compare brands of dishwashing solutions. Which one makes the best bubbles?

WATER CYCLE - WATER (2)

PROBLEM: Do all liquids make bubbles?

PREDICTION: _____

MATERIAL: bubble makers, bubble solutions

PROCEDURE:

1. Practice making bubbles with your "bubble maker." Your teacher will provide the bubble solution.

2. Test the 3 bubble solutions 3 times with your bubble maker. Record your results. Record if the bubbles were OK, fine, good, great, or no bubbles.

	TRIAL #1	TRIAL #2	TRIAL #3
SOLUTION #1			
SOLUTION #2			
SOLUTION #3			

CONCLUSION:

WATER CYCLE - WATER (2)

POST LAB

Students define evaporation, precipitation, and condensation.

OBJECTIVES:

1. Analyzing the water cycle.
2. Exploring how water moves on the surface of the Earth.

VOCABULARY:

condensation
evaporation
glacier
ground water
precipitation
water vapor
water



MATERIALS:

worksheet

BACKGROUND:

The Earth is made up of both land and water. When water is heated it changes from the liquid to the gas water vapor. This process is called evaporation. When water vapor is cooled, as it would be if it were taken higher in the atmosphere, this gas will condense, or change back to liquid form.

We can see water vapor condensing when we watch clouds. A cloud is nothing more than water vapor that has condensed back to a liquid form. A cloud is made of extremely tiny drops of water which can remain suspended in the air. As a cloud grows, and more and more water condense in the same place, the cloud droplets get larger. Eventually, these cloud droplets will be too large to remain in the air. The cloud is then said to be saturated. A saturated cloud will usually precipitate its excess water, or cause it to fall. This is how it rains or snows. Moisture falling from clouds is called precipitation.

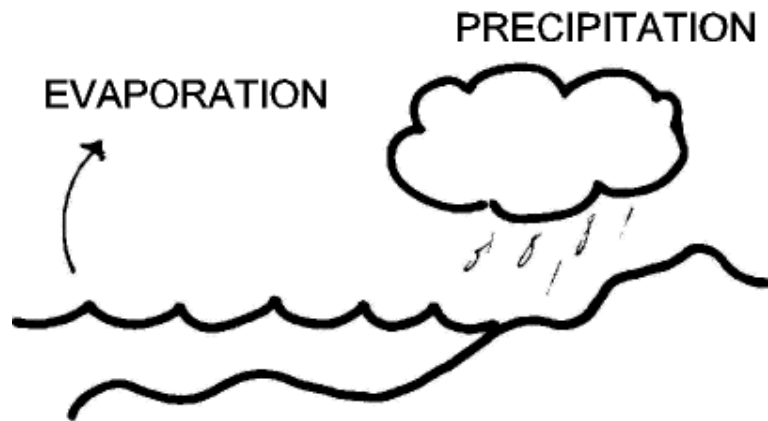
The amount of the gaseous water vapor that is in the air tells us the relative humidity of the air. Humidity is a measure of how moist or dry feeling the air is. When the air is warm, it can hold more water vapor than when it is cold. When the humidity is high, it is very difficult to dry off after swimming, since there is so much moisture already in the air, it is not easy for more to evaporate. When the humidity is low, dry air easily evaporates water.

The cycle of evaporation, condensation, and precipitation of water is called the water or hydrologic cycle. Since clouds move across the sky, the precipitation does not

usually fall in the same place that the water came from. This is how the earth spreads water across land areas and allow us to live in so many different areas.

PROCEDURE:

1. Discuss the water cycle. Make sure you explain the vocabulary by pointing out their position in the water cycle. Discuss with students the different types of condensation, evaporation, and precipitation. Condensation is the process by which gases become liquid. Water vapor in the air condenses into tiny drops. Examples include fog and clouds. Precipitation is water which condenses from water vapor. Precipitation falls to the Earth as rain, snow, sleet, and hail. Evaporation is the process by which liquid becomes gas. For example, vapors that rise from the ground on a hot day or when a puddle dries after a rainstorm. Students may confuse smoke with clouds. Smoke consists of particles of substances like oil, wood, coal, but not water. Clouds, fog, and water vapor are exclusively water.



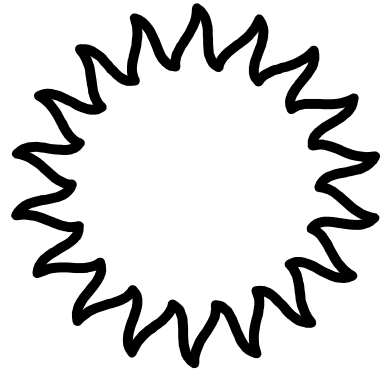
2. Give the students the worksheet and have them define each of the terms. The pictures should give them “clues” on how to define each of the terms.

WATER CYCLE - WATER (2)

POST LAB

DIRECTIONS: Define each of the words.

EVAPORATION



PRECIPITATION



CONDENSATION

