



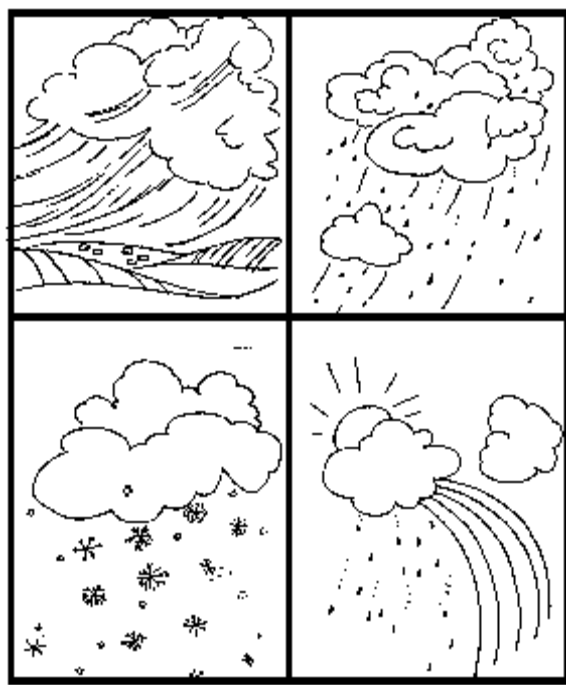
# Water Cycle

The Earth's Gift



## KINDERGARTEN

# WATER



1 WEEK  
LESSON PLANS AND  
ACTIVITIES

## WATER CYCLE OVERVIEW OF KINDERGARTEN

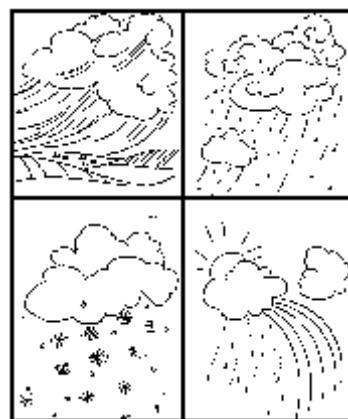
### WATER

#### WEEK 1.

PRE: *Defining the states of matter.*

LAB: *Discovering the properties of water.*

POST: *Analyzing the water cycle.*



### OCEANS

#### WEEK 2.

PRE: *Demonstrating the contents of water.*

LAB: *Experimenting with salt water and fresh water.*

POST: *Investigating oceans and lakes.*

### ATMOSPHERE

#### WEEK 3.

PRE: *Exploring how clouds are formed.*

LAB: *Analyzing the shapes of clouds.*

POST: *Demonstrating how clouds are formed in the atmosphere.*

### WEATHER

#### WEEK 4.

PRE: *Comparing different types of weather.*

LAB: *Determining the direction of wind.*

POST: *Exploring what makes weather.*

## WATER CYCLE - WATER (K)

### PRE LAB

Students color a worksheet on the three states of water.

### OBJECTIVES:

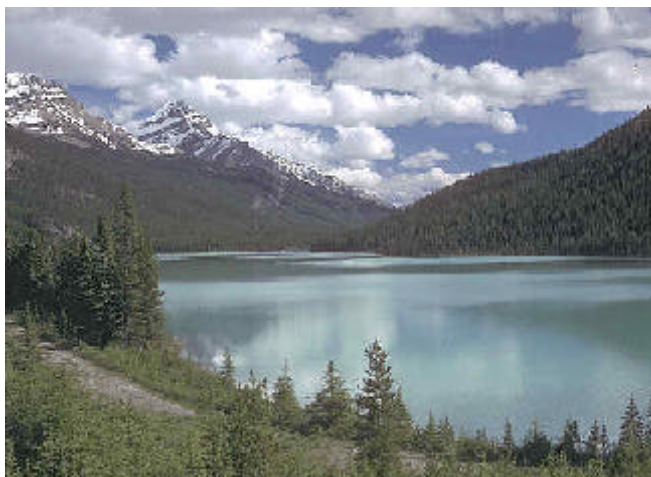
1. Defining the states of matter.
2. Exploring water as a liquid.

### VOCABULARY:

gas  
liquid  
solid  
water

### MATERIALS:

plastic glass  
water  
worksheet



### BACKGROUND:

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.

There are four states of matter commonly found in the Universe. There are solids, liquid, gases, and plasma. There is also a fifth state of matter, the Bose-Einstein Condensate which is seen at extremely low temperatures. All matter is found in these states.

Water is one of the few substances that can easily change into three of the states, liquid, gas, and solid. Water goes through three states of matter easily. Ice is when water is solid, steam is when water is liquid, and water usually refers to its liquid state.

Water is a transparent, odorless, and tasteless liquid. It illustrates the three states of matter: solid (ice), gas (steam), and liquid (water). The form it takes depends upon the temperature. At low temperatures, the molecules do not move around as much and form a crystalline structure that is rigid (ice). In the liquid state, water molecules move more freely. Water molecules in the form of steam are moving very fast with large spaces between the molecules. Although ice is crystalline, it tends to have the molecules in a rigid structure that is spaced farther than the molecules of liquid water and this is quite important, for if ice were denser, it would sink in water. Imagine what would happen if icebergs grew from the bottom of the ocean instead of floating on the surface.

## PROCEDURE:

1. Water is a unique substance. Hold up a glass of water to your class. Ask students what is in the plastic glass, and how do they know. Ask them if they have seen water in other forms. Hopefully some of your students will know that ice and steam are other forms of water. Water can take on 3 states of matter, liquid, solid, or gas.

2. Give students a small cup of water and see if they can determine what state of matter is water at room temperature. Have them touch the water, drink it, smell it, and listen to it. Do this very slowly, emphasizing the characteristics of water.

3. Students should become acquainted with the properties of a liquid. A liquid can be more than just water. Discuss with your students that even substances like a rock can become melted and act like a liquid. Wetness or coldness does not characterize all liquids. The key property of a liquid is that it flows when poured.

4. On the worksheet there are several forms that water takes in nature. Snow and hail is a solid, sleet has solids within a liquid mass, and rain is liquid. Ask students if they can find the gas phase of water. They may not recognize that a cloud contains components of water in the gas phase. Clouds also have particles in it, which are in the solid phase.

5. If students are unfamiliar with these type of weather phenomena, you may want to go over each type. Hail is frozen water that moves up and down in clouds, so it freezes as it is moving, giving it the spherical shape. Snow is water that crystallizes when the temperature gets below freezing. Sleet is when the temperature freezes, but then as it falls from the clouds it partially melts. Clouds actually contain 2 states of matter, solid and gas. Rain is liquid.



## WATER CYCLE - WATER (K)

### LAB

Students experiment with ice cubes.

### OBJECTIVES:

1. Discovering properties of water.
2. Exploring the states of matter.

### VOCABULARY:

gas  
liquid  
solid  
water

### MATERIALS:

ice cube per student  
plastic baggies  
towels



### BACKGROUND:

Determining the state of matter is not easy. Many times a substance acts like a liquid, but then sometimes it acts as a solid. Cornstarch and water is a classic example of this. If you add the appropriate amount of water to cornstarch it will act as a solid, but then if you let the solid rest, it will flow.

Matter can also change states of matter depending on the temperature. Water is an excellent example of how easily you can go from one state to another, just by increasing or decreasing the temperature.

Traditionally we have taught students that there are 3 states of matter. They assume that this is all there is. Solids, liquids, and gases are states of matter that are familiar to us on the surface of the Earth. However, deep in the Earth or deep in space, conditions are different, allowing other states of matter to dominate. For instance, plasma is the most common state of matter in the Universe.

It is important early in a child's education to make students understand, that humans define parameters within our world. But that does not make it absolutely correct in other worlds.

### PROCEDURE:

1. Discuss with students that there are 3 states of matter that water takes, liquid, ice, and steam. In order to change from one state of matter to another energy, heat in this case, needs to be used. The problem that the students will explore is how much heat it will take to convert a solid (ice) to a liquid.

2. First discuss with students what takes on the different forms of water in nature.

SOLID	LIQUID	GAS
ice	rivers	steam
icicles	oceans	clouds
snow	rain	
hail		

3. Give each student a baggy with one ice cube inside. Have the students feel the coldness. Tell them that they can use anything in the classroom, including themselves to find a temperature that will melt the ice cube, but make sure students don't use fire. You may want to disqualify a heater because that will take some of the fun away. The one who melts the ice cube the fastest is the winner. Students will discover that certain places, like armpits will melt the ice cube quickly. As students are doing this activity, make sure you go over the change of states of matter (solid to liquid).

4. After the students melt the ice cube you may want to put the water into a dish and put it near a window, and have the students look at what happens to the liquid. This can help emphasize that water goes through another state of matter to form gas (steam).

## WATER CYCLE - WATER (K)

### POST LAB

#### OBJECTIVES:

1. Analyzing the water cycle.
2. Exploring evaporation of liquids.

#### VOCABULARY:

cloud  
evaporation  
liquid  
water

#### MATERIALS:

alcohol, oil (or any other liquid that is not water)  
worksheet

#### BACKGROUND:

Water is essential in animal and plant nutrition. It is used in science and industry in making many products. Waterways are used to transport materials and dispose of wastes. Water is also a cooling agent, a cleansing medium, and entertainment mechanism.

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.

The water cycle is a major driving force on our planet. Water is in constant motion, evaporating into the atmosphere to from oceans, lakes, rivers, and streams. When the atmosphere can no longer support the moisture within the clouds, we experience rain, snow, hail, or sleet. Water is returned to the system through drainage, which results from the melting of snow that has accumulated during the winter months. This water flows on the surface of the Earth and percolates through the Earth as groundwater. Water is not actually consumed but is continuously recycled.

#### PROCEDURE:

1. Water is a liquid that is very important to all life. Demonstrate to students by

Students use a worksheet to learn about evaporation.





pouring other liquids that are not water. Emphasize that even clear liquids may not be water. Remind students to always make sure they are drinking water and not other clear liquids.

2. Have the students smell the alcohol to stress that water is odorless and tasteless.

3. Rub a little alcohol on the inside of the wrist of your students. On the other arm use water. Ask students what the difference is between the two clear liquids. Alcohol seems cooler because it evaporates quickly. Water does not evaporate as quickly.

4. Water is important in the water cycle. Using the worksheet, discuss with children how water becomes clouds by evaporation. Water can then be recycled in the process.

WATER CYCLE - WATER (K) POST

