

#10396 WATER: A FIRST LOOK

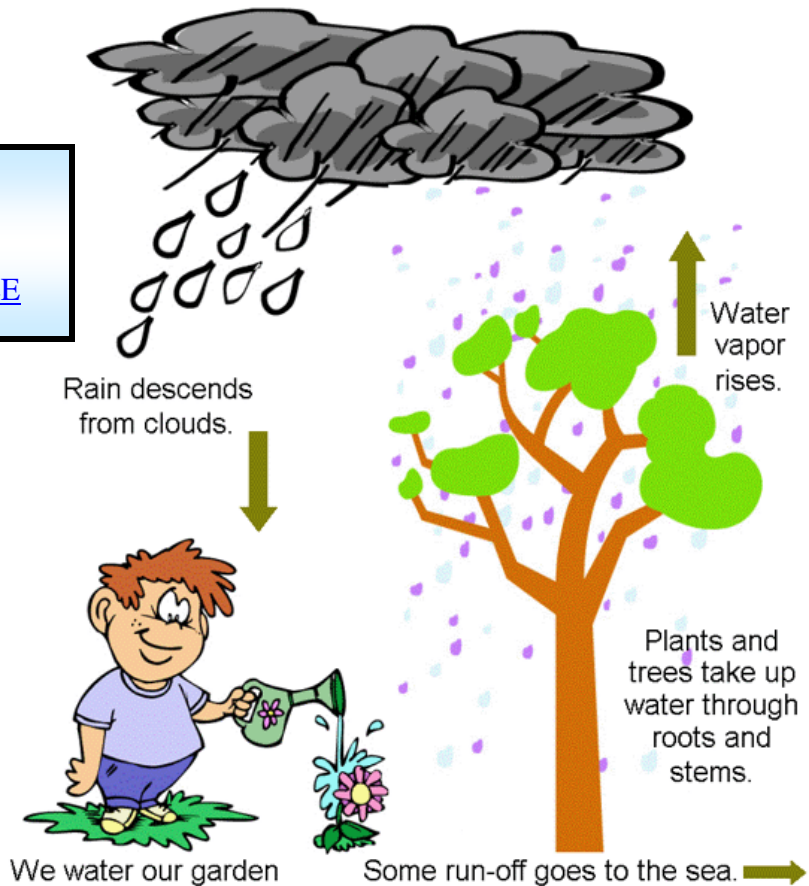
RAINBOW EDUCATIONAL MEDIA, 1999
Grade Level: 1-3
17 Minutes



CAPTIONED MEDIA PROGRAM RELATED RESOURCES

[#3021 CLOUDS \(REVISED\)](#)

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INTRODUCTION

Young students are naturally curious about the world around them. Water is an essential and familiar part of that world. The video program *Water: A First Look* focuses students' attention on some of the essential characteristics of water, including: how water exists as a liquid, solid, or gas; how water can change form; how water affects our weather; how the water cycle functions; and the differences between salt water and freshwater. The program also shows many of the ways people use and depend on water and emphasizes the importance of conserving freshwater.

The video includes students engaged in a variety of activities that the viewers themselves can duplicate at home or at school. In this way, students not only learn about water but are encouraged to observe and explore their environment.

Grade Level: This video is appropriate for grades K through 3.

Before Viewing the Video: You may want to acquaint students with some of the key terms that will appear, including, liquid, gas, solid, evaporation, freezing, condensation, and water cycle. Write these terms on the chalk board and discuss them, referring if necessary to the glossary in this guide.

PROGRAM SUMMARY

The video begins by asking viewers to imagine they are visitors from another universe seeing the earth for the first time. Among their first impressions would be that the earth is a water planet. Most of the earth's surface is covered by oceans, and rivers, streams, lakes and ponds are abundant on the land. The program differentiates between freshwater and salt water.

The program shows how many things are made up of water. It shows a girl squeezing an orange and explains that the juice is primarily water. The same girl is then shown looking at herself in the mirror. The program notes that features such as eyes and hair are easily observed. However, the fact that one's body is in large part water is not discernible in a mirror or to the naked eye.

The program then describes how living things need water to live. It notes that humans can survive for weeks without food, but for only a few days without water.

The video shows images of a woodland stream in summer and then frozen in the winter to show that water can take several forms. A student pours water from a tall glass to a short one to show that a liquid takes the shape of its container. Another student puts a water-filled ice tray into a freezer to show that water becomes solid when it freezes. Finally, the bubbles in boiling water demonstrate that water can be a gas.

The video explains that water changes from its liquid form to water vapor, a gas, through evaporation. To demonstrate, a student puts a bowl of water in the sun and comes back later to find the bowl empty.

Next, the video introduces the idea that there is water vapor in the air all around us. Condensation is illustrated by showing how water vapor in the air condenses on the outside of a cold glass.

The next segment explains how clouds form when water vapor condenses, tiny water droplets stick together to form rain, and snow or sleet form if rain freezes. The point is made that water is constantly moving and changing form.

The program then introduces the water cycle. Graphics show how water evaporates from oceans, condenses into clouds, falls to the earth's surface as rain, and flows back to the ocean.

The video then illustrates the many ways in which we use water. It shows people drinking water, fishing, boating, and swimming, as well as ships using water for transportation and farmers irrigating their land.

The program stresses that we depend especially on freshwater, which is only a small part of the earth's water. It emphasizes that while water may seem abundant, we can't afford to waste it.

A brief summary concludes the program.

OBJECTIVES

After viewing the program, students will be able to:

- explain that water is necessary for life.
- describe how water can exist as a liquid, solid, or gas.
- explain how water can change form through evaporation, condensation, and freezing.
- distinguish between freshwater found in lakes, streams, rivers, and ponds and the salt water found in oceans.
- describe in simple terms the water cycle.
- describe how water plays an important role in weather.
- describe the many ways people use and depend on water and why it is important to conserve freshwater.

REVIEW QUESTIONS

1. Where are some places where you can find water?
Answers will vary. Many students will cite oceans, rivers, streams, lakes, and ponds. Some may also note that water makes up a large part of living things.
2. What is freshwater and how is it different from ocean water?
Fresh water contains very little salt. Ocean water contains lots of salt.
3. What are three forms that water can take?
Water can be a liquid, solid, or gas.
4. What happens when liquid water evaporates?
It changes from a liquid to a gas.
5. What happens when water vapor or gas condenses?
It changes from a gas to a liquid.
6. What happens when liquid water freezes?
It becomes solid ice.
7. Describe the water cycle.
Students may need to be guided through the various stages of the water cycle, including evaporation of water from the oceans, condensation into clouds and then rain, and the return of water

to the oceans through streams and rivers. You may want to note that water also evaporates from rivers, streams, lakes and ponds and that some of the water from rain soaks into the ground. You might also note that there is no beginning or end to the water cycle. It is a process that is continuous.

8. What are some of the ways we use water?
Answers will vary. Drinking, boating, swimming, fishing, and farming are some of the examples in the program. Students should be encouraged to come up with others as well.
9. Why is it important not to waste freshwater?
Freshwater is only a very small part of the earth's water. We use freshwater in so many different ways that we may not always have enough.

ACTIVITIES

1. Salt Water Versus Freshwater

If you live near the ocean, have the students collect some ocean water in a dish and then leave the dish outside in the sun. When the ocean water evaporates, students can see the salt residue in the bottom of the dish.

In a variation of this activity, students can put two dishes outside, one containing freshwater and the other salt water. After the water in each dish has evaporated, they can compare the residues that are left .

2. Condensation Demonstration

To demonstrate condensation, take some crushed ice and put it into a glass. Make sure the glass is completely dry. Cover the glass with a piece of cardboard and then wait a few minutes. The side of the glass will become misty.

Explain that the ice cools the glass and the air in it. Cold air can not hold as much water vapor so some of the water vapor changed into a liquid.

3. Condensation: Dew and Fog

Ask students if they have ever noticed dew on grass in the early morning. Dew forms when water vapor in the air condenses when it meets the cold ground.

Explain that fog is another example of water vapor condensing. Fog consists of tiny droplets of water that have condensed from water vapor.

4. Condensation: Making Clouds

Students can see how clouds form as a result of condensation by making their own clouds. Put some hot water at the bottom of a large open jar. Then place a metal pan with ice in it on top of the jar. Water vapor that forms inside the jar is cooled near the cold metal pan, and a “cloud” forms.

5. Boiling Water Versus Evaporation

The video shows a pot of boiling water and explains that the bubbles are a gas, water vapor. Most students think that the bubbles in boiling water are air bubbles. Explain that when a liquid boils, it absorbs enough heat to form bubbles of itself within the body of the liquid. Water forms bubbles of water gas or vapor when it boils; oil forms bubbles of oil gas when it boils, and so on.

Some students may confuse evaporation with boiling. Explain that unlike boiling, evaporation takes place only at a liquid’s surface.

6. Frozen Water

When most liquids freeze, the solids they form take up less space. Water is an exception. When water freezes it expands.

To illustrate how water expands when it freezes, cut the top off a small milk carton. Then have students fill it to the top with water and put it into a freezer or—if it is cold enough—outside. When the water freezes, the ice will bulge out the top of the carton or even split the sides.

7. Power of Water

When water flows back to the oceans in rivers and streams, the force of the flowing water is powerful enough to alter the landscape by carving canyons. One of the most dramatic examples is the Grand Canyon, created by the force of water in the Colorado River over millions of years.

Students can see how water erodes land by filling a baking pan with sand and propping one end slightly with a book so that the pan and the sand it contains slope downwards. If they slowly pour water into the high end of the pan, they'll see how the flowing water erodes the sand, creating channels.

8. Conserving Water

The program mentions a few easy ways to conserve water. There are many others. Ask students to think of all the ways they and their families use freshwater. Then ask them to think of ways they could use less water. Ways to conserve water include:

- using cooking or salad-washing water to water plants outside

- limiting use of sprinklers for lawns
- not leaving the water running when washing dishes, brushing teeth, etc., except for those moments when the water is actually needed.
- not flushing the toilet except when really necessary
- washing cars with water in a bucket rather than with a hose

GLOSSARY

- boil:** to change from a liquid to a gas by the application of heat
- condensation:** process of changing from a gas to a liquid
- evaporation:** process of changing from a liquid to a gas
- freshwater:** water that is not salty
- gas:** state of matter in which a substance has no definite shape or volume
- ice:** solid water
- liquid:** state of matter in which a substance flows easily and takes the shape of the container into which it is put
- solid:** state of matter in which a substance has a definite shape and volume
- water cycle:** cycle in which water evaporates from oceans and other bodies of water; condenses; falls to the earth's surface as rain, snow or sleet; and returns to oceans and other bodies of water
- water vapor:** water in the form of a gas

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Wetland Biomes: Essential and Endangered

SCRIPT

Title *Water: A First Look*

Narrator

Imagine you were a visitor from a faraway universe, approaching the earth for the first time. What would you notice about this planet?

From a distance, the earth might seem like other planets; but as you got closer certain features would begin to stand out. You would see large land masses called continents, and clouds, looking like cotton, floating above the earth's surface.

Most of all, you would notice that the largest parts of this planet are blue. These areas are blue because the earth's surface is covered mostly by water.

Water is the earth's most noticeable feature. If you walk to the edge of any continent or island, you can look out on vast oceans stretching as far as the eyes can see and way beyond.

Oceans contain most of the earth's water but not all of it. There is water in streams and rivers that flow across the land. Lakes and ponds also are important parts of landscapes. The water in streams, rivers, lakes, and ponds is called fresh water. Freshwater contains very little salt, unlike ocean water, which contains lots of salt.

You can find water in many other places...places where you might not expect it. Look at an orange. It's round. It feels hard. It doesn't look like water;

but if you have an adult cut an orange in half, and then you squeeze it, you'll see that an orange is full of juice. This juice is mostly water.

There is water in still other places you might not think would have water.

Look in a mirror. What do you see?

Girl

I've got bluish, greenish eyes. My hair is brown. I have a mouth and nose.

Narrator

The color of your eyes and hair, and the shapes of your nose and mouth are all parts of what makes you you.

But you also are made of water. You can't see it, but water makes up a large part of the blood and skin and other things in your body. In fact, if you weigh 50 pounds, over 35 pounds of that is water.

Thirty-five pounds! That's more than enough water to fill these two buckets.

Water is an important part of all living things. All living things need water to survive. Tree frogs in a rain forest need water. So do snakes in a desert, fish in the ocean, and birds in the sky.

All the thousands of different kinds of plants also need water. Even in a desert, where there is very little water, plants have ways of getting the water they need. This cactus stores water in its trunk after a rain, and then uses the water over the many weeks and months when it doesn't rain.

We humans can't store water like a cactus, so we need to drink water often.

We could live for weeks without food, but we can live only a few days without water.

When we think about water, most of us think about water dripping from a faucet, or waves sweeping onto a beach, or a stream flowing over and around rocks;

but water can have other forms, too. The same stream may look very different in the cold of winter. When it gets cold enough, water freezes, and ice forms.

The water in this lake forms a mirrorlike surface in the fall. This water is in a liquid form. When the lake's surface becomes hard ice in the winter, it is a solid.

When something is liquid, it can change its shape. Pour water from a tall glass into a short one. The liquid water takes the shape of the glass into which it is poured.

To see what happens when water becomes solid, fill an ice tray with water,

and put it into a freezer. In a few hours the liquid water will become solid ice.

Even if you take the ice out of the tray and put it into a glass, it keeps the same shape. It doesn't take the shape of the glass. Solid ice and liquid water are two forms of water.

There is another form. Look at the boiling water in this pot. The bubbles you see contain an invisible gas called water vapor. When water is heated it changes into water vapor.

You don't have to boil water for it to become a gas. Put a bowl of water in the sun. Mark how much water is in the bowl. Then come back in a few hours. There is much less water in the bowl. In fact, there might not be any water at all. The water in the bowl changed into a gas and became part of the air around us. This is called evaporation. Evaporation also happens when we hang wet clothes outside to dry. The water that makes the clothes wet turns into a gas that mixes with the air.

Water also can change from a gas to a liquid. Look at the drops of water on the outside of this cold glass. The cold glass makes the water vapor in the air around it change back into liquid form. The change from water vapor to liquid water is called condensation.

You can see condensation in many other places. Look above you. Have you ever looked closely at clouds? They take many shapes and forms. Clouds are like the water that condenses on the outside of a cold glass. Clouds form when water vapor in the air condenses around bits of dust and form tiny droplets of water. When these tiny droplets stick together, they form bigger droplets. When they become too big and heavy for the cloud to hold, they fall.

Kids

It rains.

Narrator

What do you think happens to rain when it gets cold enough for water to freeze?

Kids

It snows!

Narrator

Just as ice forms when water freezes on the surface of a lake or pond, when rain freezes it forms snow or sleet.

The air around the earth forms a layer called the atmosphere. Water in this air constantly changes. The different forms of water affect our weather. On a sunny day you can't see water in the air, but it's there as an invisible gas called water vapor.

Sometimes water vapor condenses to form liquid water, first as tiny droplets that make up clouds. Then these droplets form bigger droplets that make up rain. Sometimes the liquid water freezes to form snow. Water is constantly moving and changing form.

While water may change its form, the amount of the earth's water changes very little. Think about all the water that flows into the oceans from rivers and streams. If we ran a faucet in a sink with the plug in, the sink would soon fill and overflow; but the oceans don't overflow. The water level stays about the same.

Now think about this. Many of the rivers that flow into the oceans have been around for thousands, even millions of years, but they are still full of water. Where does this fresh water come from?

The oceans don't overflow, and our streams and rivers continue to contain water because water is always moving and changing form. This is called the "water cycle".

Let's see how the water cycle works. We'll start with water in the oceans. The oceans don't overflow because they constantly lose water when the sun heats their surfaces. Heat from the sun causes water to evaporate or turn into water vapor...just the same way that water evaporates in a bowl left out in the sun.

High up in the air, the water vapor is cooled. It condenses and tiny droplets of water form clouds...the same way that water vapor condenses when it hits the cold surface of the outside of a glass.

The water droplets in clouds form bigger droplets, and after a while it rains.

When rain falls over land, some of the water soaks into the ground,

and much of it collects in streams and rivers. The water in these streams and rivers then flows back to the oceans. Here, the water will eventually evaporate again as the water cycle repeats itself over and over.

Have you ever thought about all the ways we use water? We drink water to be able to live, but think of some of the other ways we need and use water.

We use water to have fun. We fish in it...raft on it...swim in it...explore in it.

We use water to get from one place to another. Boats and ships sail on the world's oceans and rivers, carrying people and cargo.

We use water to wash things...to cook...and to put out fires.

We use water in fountains, to water lawns, and to fill pools.

Farmers use water to grow crops. In places where it doesn't rain enough, they may bring in water from far away through pipes and canals. This is called irrigation.

But there is a problem. We use water in so many ways that we don't always have enough. How can this be possible with all the water in the oceans?

The water in the oceans is salt water. Salt water can't be used for drinking, or watering crops, or most of the other things we need water for. Only fresh water can be used for these things.

Imagine that this glass contains all the water on earth. If we poured out all the salt water in the earth's oceans, this much fresh water would be left.

Even then, most of the earth's freshwater is frozen in glaciers or ice. This leaves freshwater from rivers, streams and lakes, or freshwater that comes from underground. This is only a very small part of the earth's water. So, although the earth has lots of water, we can't afford to waste it.

There are many ways to save water. Even little things help. For example, we can save water by not leaving faucets running unnecessarily, and by taking showers instead of baths and keeping the showers short.

In this program we've seen many things about water.

We've seen that water takes many forms. Water can be a liquid that you pour. It can be a solid, like cubes of ice in a glass. It can be a gas, like the gas in the bubbles in a pot of boiling water.

We saw how water can change form, as when the water in a lake or stream freezes in the winter, or when water on wet clothes evaporates and becomes a gas.

We also saw that water is important in many ways. Living things need water in order to live. We need water to grow things, and to get from place to another.

We also need water just for the way it makes us feel when we swim in a pool...

or to enjoy the sounds of waves crashing on a beach.

For many reasons, water is an essential part of our lives.

THE END