



Lesson 1: Water, Water Everywhere

In this lesson, students will discover the vital importance of water as a natural resource as well as the specific observable properties of liquids and solids.

Focus

Water as a Natural Resource; Properties of Solids and Liquids

Focus Questions

- Why is water important to me?
- What are the properties of solids and liquids? How do solids and liquids differ?
- How can I separate mixtures?

Learning Objectives

- Students will be able to use data to describe the properties used to classify matter as a solid or a liquid.
- Students will be able to develop and use models to exemplify how matter can be mixed together and separated again based on the properties of the mixture.

Materials Needed

Our Water PowerPoint	Flushable Wipes
Jug of clean water	Catch bins
Clear Jars(2)	Trash bags
Toilet Paper	Paper Towels
Large Spoon	Toy food
Plastic Drop Cloths	Rocks (various types)
Sand	Construction Paper/ Balls
Water bottles	Small solids (marbles, coins,etc)
Vegetable Oil in bottles	
Clear cups (4 for each group) – 2 different sizes	

Key Words

Natural Resource, Earth Material, Salt Water, Fresh Water, Polar Ice Caps, Glaciers, Scientific Observation, Opinion, Properties, Solid, Liquid, Mixture



Grade Level: 2

Prior Knowledge Required

- Students should also be able to demonstrate an understanding of the observable properties of matter. (K.P.4)

Future Knowledge

- Students will demonstrate an understanding of the properties used to classify matter and how heat energy can change matter from one state to another.

South Carolina Science Standards and Performance Indicators Addressed

2.P.3A.1; 2.P.3A.2



Engage

Begin the lesson by asking the students, "Who has seen a *Teenage Mutant Ninja Turtles* cartoon?" Several students are likely to raise their hands. If there are many students who are unfamiliar with the characters, you can show a picture of the cartoon (a picture is included in the *Our Water* PowerPoint).

Then, ask the students, "Do you know where the turtles live?" Students should respond that the characters live in the sewers.

Next, ask, "What else is in the sewer system?" You are likely to get various answers. If necessary, ask leading questions that will allow students to conclude that water is a major component of the sewer system.

From here, begin to discuss the importance of water to humans. Pose the question, "Why is water important to you?" You will receive a variety of answers. Based upon student answers, ask the following questions to continue the discussion:

- *Is the earth made of more land or water?*
- *Do you have water in your body? How much?*
- *What do people use water for?*
- *Is all water on earth safe to drink? If not, how much water on earth is safe to drink?*

You can use the *Our Water* PowerPoint as a visual guide during your discussion.

Explore

After your introductory discussion about water, using two different clear jars, fill each jar with clear water. Place a flushable wipe in one jar and toilet paper in the other. Have students predict which one will break down/dissolve completely in the water (wipe, toilet paper, or both)? Students should verbalize the reason for their prediction.

Let the jars sit for the remainder of the lesson (stir them occasionally with a large spoon).

Next, ask students, "Using your five senses, how can you describe water? How does it look, smell, sound, feel, and taste?" Summarize the description of water.

Further the discussion by telling students how scientists use observations. You could say something like the following:

Be sure students know the following:

- The earth has more water than land, but only a small amount is drinkable.
- Saltwater makes up most of the water on earth.
- Freshwater makes up very little of earth's total water supply. It is drinkable.
- Most of the human body is water.
- No living thing can survive without water.
- Humans use water for many things (see list on PowerPoint).
- Water is a natural resource and is one of the most valuable on earth. Water is liquid.
- Natural resources are substances that come from nature and are used by people.
- Water is clear and feels wet.
- Water takes the shape of its container, which includes ponds, lakes, and oceans.
- Water moves by flowing downhill due to gravity and eventually flows over the ground, into rivers, and finally into the ocean.
- The appropriate, safe ways to use their five senses in observing.
- All scientists observe their world and classify materials based on their properties, including physical appearance.



"When you tell me about water using your five senses, you are acting like scientists! Scientists use their five senses to observe and learn about the world around them. Scientists can observe properties of objects like size, shape, color, texture (how something feels), and shininess. Also, scientists use their observations to sort matter into groups, like solids, liquids, or gases. Now, we are going to practice being scientists! We are going to observe different objects using our senses! Then, we are going to decide which ones are solids and which ones are liquids."

Next, separate the students into groups. Give each group a few pieces of toilet paper, a flushable wipe, various rocks, a bottle of water, a bottle of oil, and a container of another type of small solid (marbles, coins, etc). Then, give each group 4 cups of 2 different sizes (this allows them to compare how solids and liquids fill the same container). Also, be sure to put a drop cloth under the students as this can get messy.

Instruct students to use their five senses to observe the properties of each object (except for taste). For the observations, have students use the Solids and Liquids observations chart (see attached). Ask questions during the activity, such as:

Which objects are similar? How?

Which objects are different? How?

Which objects do you think are solids? Why?

Which objects do you think are liquids? Why?

Also, after they have completed their charts, have the students physically move the objects into one group of solids and one group of liquids. Explain that scientists call a sample of matter a "liquid" or a "solid" based on its properties. Explain the properties of liquids and solids using the properties of the objects the students observed. Use the *Our Water* PowerPoint as a guide.

Explain

Summarize the exploration activity. Next, refer to the two jars created earlier. Ask students questions such as *"Which one dissolved more? Which one would be better to put in the toilet when you use the restroom? Why?"* Students should observe that the toilet paper dissolved much more efficiently than the flushable wipe. Once they understand this, explain that this is the reason we do not put anything except toilet paper in the toilet. Everything else can get stuck. When it

Be sure students know the following:

Solids and liquids are two forms of matter that have distinct observable properties.

Liquids

- A form of matter that does not have its own shape.
- Takes the shape of the container it is in.
- Can flow, be poured, or spilled.
- Can change to a solid by freezing, for example, water to ice cubes.

Solids

- The only form of matter that has its own shape.
- Examples: chairs, rocks, or coins.
- Properties are color, shape, size, weight, texture, buoyancy (sinks or floats), hardness, and magnetism.

Some matter can be mixed together and then separated again (water and sand).

Possible Misconception:

Students sometimes confuse scientific observation with opinions. You may need to explain that scientific observations are always the same no matter who is making the observation whereas opinions may differ from person to person (ex: flower is yellow vs flower is pretty).



comes to what goes in the toilet, follow the three P's: *Poop, pee, and paper!* (Students love this!)

Elaborate

Referring again to the objects that the students observed in the explore section. Using two different jars, mix water and sand in one and water and oil in the other. Then, ask students to predict what will happen in each jar after it is shaken.

Shake each jar and let them sit for a few minutes. Ask students to describe what they are observing. The sand should settle down to the bottom of its jar, and the oil will float on top of its jar as it is less dense than water.

Ask students *"Which mixture would be easier to separate again? Why? How would you separate them?"* Ultimately, students should realize that a mixture of oil and water is much harder to physically separate than water and sand. Therefore, when you pour oil (anything other than water) down the sink, those things stay in our pipes and clog them. *When it comes to oil, fats, and grease in the kitchen: "Cool it, can it, and trash it!"*

Note: Oil and water can be separated using emulsifiers or detergents. Students will visit this subject again in another lesson.

Evaluate

As an informal check for understanding, there are two games students could play. For the first game, you will need two large containers of some kind (buckets would work well). You will also need toy food items, objects to represent poop and pee (you can use brown/ yellow balls for this or balled up pieces of yellow/ brown construction paper), and toilet paper. One bucket should represent trash, and the other bucket should represent the toilet. During the game, instruct students to throw the objects in the correct bucket. In other words, food goes in the trash, and poop, pee, and toilet paper go in the toilet.

As a second game or activity, use the words and photos provided in the *Our Water* PowerPoint. Then, have the students sort the objects into groups of solids and liquids based on various properties.

Resources

"Support Guide 3.0 for First Grade." South Carolina Department of Education Office of Standards and Learning, June 2018.

For More Information and Feedback:

We value your feedback on this lesson, including how you use it in your formal/ informal education settings. Please send your comments to:
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Acknowledgements:

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Solids and Liquids Chart:

Directions: Glue or write the properties (next page) you observe for each object in the correct square. Then, if you think the object is a solid, write an "S." If you think the object is a liquid, write an "L."

Water

Rock

Oil

Toilet Paper

Wipe

Small Object

Properties:

Note: You may not use all properties. Some may be used more than once. Write in any other properties you observe.

Flows	Does Not Flow	No shape
Has a Shape	Pourable	Not Pourable
Rough	Smooth	Sinks
Floats	Does Not Sink or Float	Hard
Soft	Shiny	Not Shiny
Magnetic	Not Magnetic	Large
Small	Heavy	Light Weight
White	Gray	Brown
Black	Red	Yellow
Blue	Green	Purple
Orange	Circle	Square
Rectangle	Triangle	