OERB®

Virtual CLASSROOM

Water Fun Lesson Guide

Lesson Guide | Description

Instructor: Tisha Dewitt
Grade Level: 3 - 5
Subject: Science

Students will be engaged in several experiments exploring the physical properties of water, surface tension and cohesion.

Why:

Have you ever wondered how water bugs walk on the surface of the water without sinking? Complete this lesson to learn more about water properties such as surface tension and cohesion.

Goal:

The students will be provided a worksheet to complete throughout the lesson. At the end of the lesson, the students should be able to create their own experiment and complete the challenge.

Lesson Guide Agenda:

- Vocabulary
- Materials
- Activity Instructions
- Challenge
- Additional Resources
- Oklahoma Academic Standards

Lesson Guide | Vocabulary

Surface Tension:

- Surface Tension is an effect where the surface of a liquid is strong.
- Some insects, like water striders, can run on the surface of water because of this.
- This property is caused by the molecules in the liquid being attracted to each other (cohesion).

Cohesion:

- Cohesion is the attraction between molecules that are alike.
- A water molecule is made up of 1 oxygen atom and 2 Hydrogen atoms.
- When two water molecules come close to each other the H (Hydrogen) atom of one water molecule is attracted to the O (Oxygen) atom of the other water molecule.

Experiment 1

Materials Needed:

Aluminum Foil
2 Pennies
Water
Oil – Mineral Oil, Vegetable Oil, or Canola Oil
2 Droppers – Medicine Droppers, Pipettes, or Straws
2 Cups
Lesson Worksheet

Watch the "Water Fun" video before continuing to the experiments!

Be sure to print and complete your worksheet!

If you have any questions throughout this lesson,
please email teachers@oerb.com.
We would love to hear from you!

Experiment 1 Instructions:

1. Cut two pieces of aluminum foil into 6” x 6” square.
2. Place the two pieces of aluminum foil side by side.
3. Place one penny on top of each piece of aluminum foil heads up.
4. Use dropper #1 to place 5 drops of water on the center of one penny.
5. Use dropper #2 to place 5 drops of oil on the center of the second penny.
6. Observe: Get eye level with the pennies and look at the surface of the liquid from the side.
   a. What do you observe?
   b. Do they look the same or different?
7. Use your worksheet to draw what you have observed.

Experiment 2

Materials Needed:

Water
Clear plastic cup or clear kitchen glass
Tray or pan
Pennies
Lesson Worksheet

Experiment 2 Instructions:

1. Fill the clear cup or glass all the way to the top with water.
2. Place the cup in the center of the tray or pan.
3. Make a prediction on your worksheet:
   a) How many pennies will you be able to place in the cup without spilling any water?
4. Place one penny at a time, very careful, into the center of the cup of water. Be careful not to touch the water with your fingers or hand.
5. Observe – Occasionally get eye level with the cup and observe the surface of the water.
6. Continue to place pennies in the cup until the water spills over the edge.
7. Record on your worksheet how many pennies you placed into the cup before the water spilled over the edge.

Experiment 3

Materials Needed:

Water
Bowl
2-3 Small Paperclips
Lesson Worksheet

Experiment 3 Instructions:

1. Fill a bowl half full of water.
2. Gently place the paper clips flat on the surface of the water. You may need to practice this.
3. Observe: What is happening?
4. Use your worksheet to draw your observations.

Experiment 4

Materials Needed:

Bowl of water with Paperclips
Black Pepper
Dish soap
Lesson Worksheet

Experiment 4 Instructions:

1. Using the same bowl of water, sprinkle black pepper on the surface of the water.
2. Place one drop of dish soap on your index finger and rub it around.
3. Submerge your finger into the center of the bowl.
4. Observe: What is happening?
5. Using your worksheet, explain what happens to surface tension when you add dish soap to water.

Challenge:

Want to get creative and have some fun? We challenge you to create your own experiment involving surface tension and water!

WANT TO WIN A PRIZE?

Take a picture of your challenge or your worksheet and share it with us by emailing teachers@oerb.com and on Facebook/Instagram by tagging us @oerbok.

Be sure to include your name, grade, school, and teachers!

The teacher with the most student submissions will win a $100 Amazon Gift Card!

Lesson Guide | Additional Resources

If you would like to explore the properties of water further, check out these additional resources!

1. OERB Virtual Field Trip "Well Site Tour"
   https://vimeo.com/user25257321/review/107481982/8e8d5be532

2. What is Surface Tension? | Richard Hammond's Invisible Worlds | Earth Lab
   https://thekidshouldseethis.com/post/surface-tension-water-strider

3. Oklahoma State Department of Education – Science
   https://sde.ok.gov/science

Lesson Guide | Oklahoma Academic Standards

1.A.1 Identify patterns found in real-world and mathematical situations.
1.1.R.4 Students will restate and follow simple two-step directions.
2.1.R.4. Students will restate and follow multi-step directions.
2-ESS 2-2 Crosscutting Concepts: Patterns – Patterns in the natural world can be observed.
2-ESS 2-3 Obtain information to identify where water is found on Earth and that it can be solid or liquid.
2-PS 1-1 Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.
2.A.1 Describe the relationship found in patterns to solve real-world and mathematical problems.
3-PS 2-1 Students who demonstrate understanding can: Plan and conduct investigations on the effects of balanced and unbalanced forces on the motion of an object.
4-ESS 2-2 Crosscutting Concept: Patterns – Patterns can be used as evidence to support an explanation.
5-PS 1-3 Make observations and measurements to identify materials based on their properties.

Additional standards may apply to your extensions of this lesson and can be viewed here.