WOW Program Lesson Plan

States of Matter

Program Duration:
10-15 minutes

Recommended Grade Levels:
Grades K-5, but all ages could participate

Materials Needed:
- Raisins (just a few)

- Carbonated water and regular tap water

- 2 clear glasses (so that you can observe what is happening within the glass)

- Provided other concrete examples of solids, liquids, and gases (for gases, can use your own breath!)

Learning Objectives
1. Students will be able to identify the different states of matter
2. Students will be able to share basic characteristics of the different states of matter

Preparation
- Discuss what the differences are between the three states of matter.
- Ask student if they can think of an example of a solid, liquid, and gas. Gas will be the most difficult, but you can mention what is inside of balloons, the air all around us, or breath.
- For younger kids, you could focus more on solids versus liquids because this is easier to visualize.

Background
What exactly is this word “matter” that we keep using? Matter is anything that takes us space. Everything around us has a state of matter. The places we sit, the air we breathe, the water we drink or take a bath in are all examples of different kinds of matter. Not everything that we touch feels the same though. Have you ever noticed that if you press down on the table that it is hard, but if you tried to grab water, it would all squish out of your hands? This is because they are different states of matter, made up of different little itty-bitty molecules either squished together or spread out. We are going to investigate the 3 different states of matter today: liquid, solid, and gas.

Activity
1. Pour some of the carbonated water into the clear glass and then place a couple of raisins into the glass. Ask the student for observations. Are they floating or sinking? What happens once they reach the top of the water? Do they stay there or drop back down? What is all around the raisins?
2. Repeat with the tap water and ask similar questions. What is happening to the raisins? Where do they go? Do they stay at the bottom or at the top? Compare their observations to the observations from the carbonated water.

Additional Questions
1. Why do you think the raisins in the carbonated water floated to the top? What was surrounding them?
2. Give an examples of a solid, liquid, and gas from this experiment.

3. What happens if you push the raisins down in the carbonated water? Do they stay at the bottom or float to the top? What about if you place the raisins in the still water at the top of the water? Do they float or sink? Can you think of any reasons why these answers might be different?
4. What if we repeated this experiment with a heavier solid like a marble? Would we observe the same things as with the raisin?

Summary

In the carbonated water, the carbon dioxide bubbles (a gas) gather around the raisin and float the raisins to the top. Once the bubbles pop, the raisin falls back down, and the process starts all over. Because there are not carbon dioxide bubbles in the still water, the raisins fall and stay at the bottom. This experiment shows a solid (the raisin), a liquid (the water), and gas (the carbon dioxide bubbles) all in one glass. It can be used to easily picture all 3 states of matter.

Extended Exploration

- Try this experiment with solids of varying weights (raisin versus marble, raisin versus a peanut, etc). Observe the differences with the different sizes.
- Let the carbonated water sit out for a couple of hours and redo the experiment. Observe what is different and discuss why this might be. For older students, you could add an element of scientific data recording and time both trials using a stop watch and compare.
- A good explanation video of the states of matter: https://youtu.be/JQ4WduVp9k4

Adapted from: https://buggyandbuddy.com/dancing-raisins-science-experiment-science-invitation-saturday/

