Science Magic Pre-Lab Lesson

Dancing Raisins

Overview

In this lesson, students work in pairs or small groups to predict, observe, and explain the behavior of raisins in a carbonated soft drink. As students conduct the activity, the nature of scientific inquiry is emphasized as students complete a PAW Report (Predict, Actual, Why) to demonstrate their findings.

Materials

- Scissors
- 2 clear, plastic cups for each pair of students
- Raisins, cut in half
- Spoons
- Paper towels
- Pitcher of water
- Light-colored soft drink, such as Sprite® or Mountain Dew®

Getting Ready

- Make copies of the PAW Report below, and cut in half so that each student will get only one report.
- Cut the raisins in half

Procedure

Begin the activity with a discussion of the nature of science. Ask students to give examples of what scientists do and how they come to understand the world around us. Scientists ask questions, make predictions (hypotheses), conduct experiments, make observations, collect data, form conclusions, etc. Depending upon the time available, elaborate on the students' responses by asking questions such as "How do scientists make observations?" (with their senses) or "What do scientists do when they perform experiments?" (Collect data, make observations, write down their procedure, etc.)

Let students know that they will be conducting their own investigations on the behavior of raisins in different liquids---water and soft drink. Show students the materials and ask them to PREDICT what the raisins will do in each of the liquids. Students should record their predictions on their PAW Reports. Give each group of students a handful of raisins, a cup ½ filled with water and a cup ½ filled with soft drink (Note: Don't pour the soft drinks until the students are ready to use them.) Then, have students place half of their raisins in the water and the other half of their raisins in the soft drink. Have students record the ACTUAL results on their PAW Reports. Challenge students to think about WHY the raisins behaved as they did in each of the liquids and to record their explanations on their PAW Reports. To wrap up the activity, ask students to share their observations and their explanations with the class. Allow a few additional minutes for students to update their PAW Reports with any new information they have gained from the discussion.

Explanation

When the raisins are placed in the water, they sink. When the raisins are placed in the soft drink, they tend to sink to the bottom of the cup, then rise to the surface, and then sink again. The alternating sinking and floating pattern tends to repeat itself for at least several minutes.

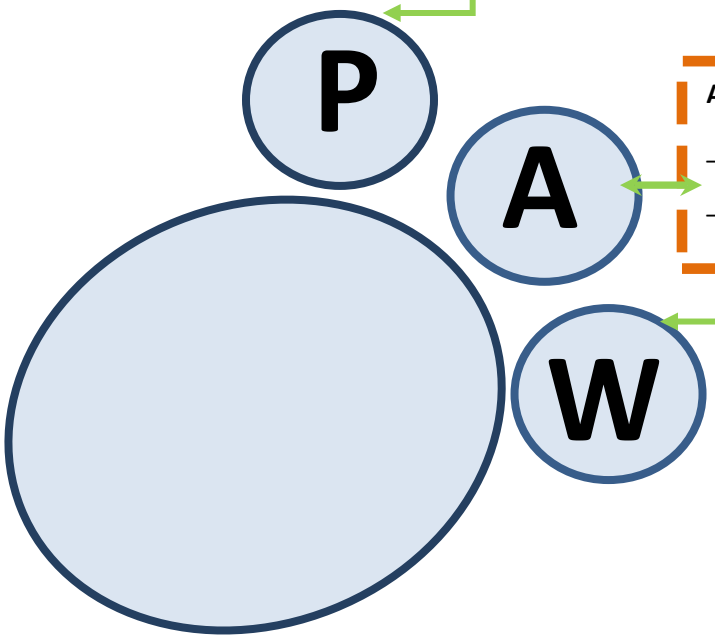
The sinking or floating of different solid objects in a liquid depends on the density of the solid object relative to the density of the liquid. If a solid object is less dense than a liquid, it will float. If the solid object is more dense than a liquid, it will sink. When the raisins are placed in the water, they sink because they are more dense than the water.

When the raisins are placed in the soft drink, a new factor is introduced: carbonation. Soft drinks contain carbon dioxide gas which is evidenced by the bubbles that we observe in these drinks. When the raisins are placed in the soft drink, they initially tend to sink because they are more dense than the soft drink. However, when carbon dioxide gas bubbles attach to the outside surface of the raisins, they act like “floaties” for the raisins. The raisins with the attached carbon dioxide bubbles are now more buoyant and therefore, less dense than the soft drink and they float to the surface. Once the raisins get to the surface, some of the carbon dioxide bubbles burst and the gas escapes into the air. The raisin is now more dense than the liquid, and once again sinks to the bottom of the liquid. The process will repeat itself as long as there is sufficient carbon dioxide gas left in the soft drink.

At the conclusion of the activity, you might choose to tie in the idea of science magic in preparation for the upcoming live e-Lab. Most times, we can say that “magic” is just science that we don’t yet understand. However, when we observe and investigate further, we can often find a scientific explanation for the “magic” that we observe. It doesn’t make the tricks any less fun or magical – it just means that you, as the scientist, are smarter than the trick!

Science Magic Lab Journal

P.A.W. Report



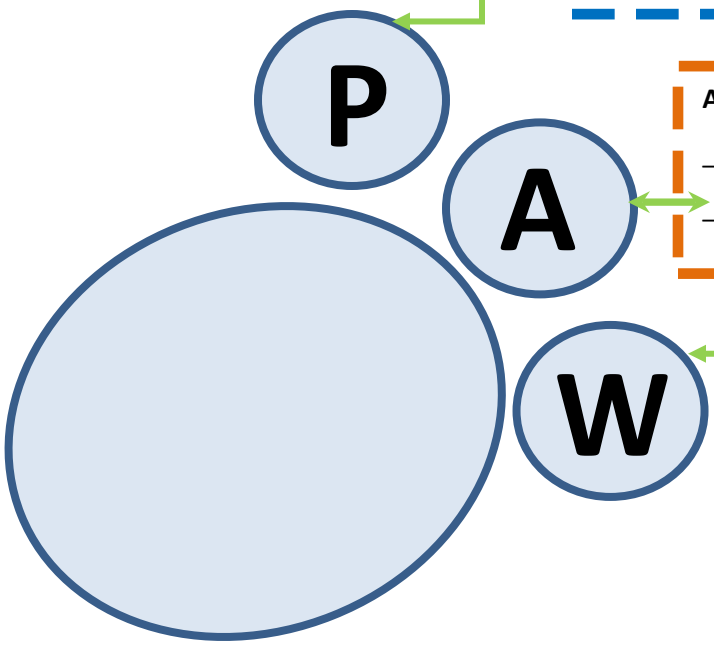
PREDICT:_____

Actual:_____

Why:_____

Science Magic Lab Journal

P.A.W. Report



PREDICT:_____

Actual:_____

Why:_____