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Lesson Plan

Title:
Exploring Capillary Actions: A Hands-on Water Experiment

Grade Level: 6th Grade

STEAM Areas: Science, Arts, Mathematics

Materials Needed:
- Two clear glasses;
- colored water (possibly using food coloring);
- a paper towel or tissue paper;
- a workspace suitable for potential water spill;
- optional scientific journal for note-taking;
- safety goggles.

Objectives:

The experiment aims to
1. Demonstrate capillary action's real-world implication;
2. Explain the relationship between molecular attraction and water movement;
3. Reinforce the concept of equilibrium in a system.

Procedure:
- Begin by discussing the scientific principle for the day, capillary action, in a simplified manner: "The movement of a liquid along the surface of a solid caused by the attraction of molecules of the liquid to the molecules of the solid."
- Introduce the items needed for the experiment: two glasses, colored water, and a paper towel.
- Give each student the materials necessary, advising them to place the two glasses side by side on their workspace.
- Instruct them to fill one of the glasses with colored water to about halfway. The addition of color enhances the visibility of the transferring water.
- Next, guide them to take a paper towel and fold it down the middle lengthwise to increase its strength and ability to transfer colored water.
- Direct one end of the paper towel to be dipped into the colored water and the other end into the empty glass. The portion of the towel in the colored water should be greater to facilitate better water movement.

Procedure:

- Instruct the students to observe the setup for a few hours and make observations, such as water being transferred to the empty glass through the paper towel.
- After a couple of hours, bring to their attention that the water keeps flowing until they attain an equal amount of water in both glasses due to an equilibrium being achieved in the system.
- Wrap up the experiment by explaining that molecules of water are attracted to each other and form temporary hydrogen bonds leading to surface tension. The water was also attracted to the hydrophilic molecules of the towel which drew water upwards against gravity.
- Conclude by questioning students about their observations and understandings, encouraging nuanced answers and discussions.

Assessment:

The students will be assessed based on their involvement in the experiment, their scientific journal entries, and their understanding of capillary actions and molecular interaction.

References:

- https://www.youtube.com/watch?v=w_tc8tlEoBs
- Kids Science Experiments - Capillary Action. https://www.sciencetots.org/kids-science-capillary-action/
- Water Molecule Activity. https://www.usgs.gov/special-topic/water-science-school/science/water-molecule-activity?qt-science_center_objects=0#qt-science_center_objects