

How Many Changes Can You See?

Simple STEM Activities You Can Do at Home

See a short video of the activity at:

Purpose:	The purpose of this activity is for students to observe and investigate the changes that occur as solids, liquids, and gases interact.
Standard:	<p>S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.</p> <p>S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.</p> <p>S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.</p> <p>a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.</p>
Materials:	Cooking oil (corn, vegetable, olive), water, clear glass, food coloring, 1-2 Alka-Seltzer tablets.
Procedures:	<ol style="list-style-type: none"> 1. Pour about 1/3 cup of water and 2/3 cup of oil into a glass. Observe how the oil and water interact. 2. Add a small piece of Alka-Seltzer to the glass. Observe carefully and describe as many changes as you can detect. 3. Add 2-3 drops of food coloring and observe carefully. 4. As needed, continue to add small pieces of Alka-Seltzer. 5. Try to explain the unusual up and down motion of the liquids. 6. If appropriate, try to classify the changes as physical or chemical.
Science Behind It:	<p>Close observation of this system, and its subsequent motion, can lead to a great discussion of a myriad of science concepts. At the start, differences in texture (feel), color, smell and viscosity (thickness) of the substances can be noted. Identifying each substance as a solid, liquid, or gas can also be helpful as students process the similarities and differences of each state of matter. After pouring one liquid on top of the other, the fact that one liquid is heavier than the other can be used to discuss density differences. The observation that the liquids are insoluble in each other can also lead to some excellent discussions in with respect to mixing, dissolving, and dispersing.</p> <p>As tiny pieces of Alka-Seltzer are added, the system is quickly propelled into a fast moving and quickly changing arena. As students observe the gas bubbles, they may infer this as a sign of a chemical reaction. In this case, a chemical reaction between substances in the tablet causes the production of carbon dioxide gas and sodium citrate (new substances). The carbon dioxide gas bubbles attach to water droplets making them less dense and giving them plenty of lift to rise to the top.</p>
Questions to Ask:	1. Explain why you think some of the liquid moved from top to bottom?