

My Rubber Eggies

Simple STEM Activities You Can Do at Home

See a short video of the activity at: https://www.youtube.com/watch?v=zQG6Q_LoJXw

Purpose:	The purpose of this activity is for students to observe and explore the changes that occur to the outer surface (shell) of eggs while they are soaking in vinegar.
Standard:	<p>S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.</p> <p>a. Ask questions to describe and classify different objects according to their physical properties.</p> <p>S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.</p> <p>c. Plan and carry out an investigation to determine if a chemical change occurred based on observable evidence (color, gas, temperature change, odor, new substance produced).</p>
Materials:	4 Raw Eggs, Vinegar, 4 clear glasses, water
Procedures:	<ol style="list-style-type: none"> 1. Place 4 eggs in a glass and cover with vinegar (10-12 ounces). 2. Add 4-5 drops of food coloring to 3 of the glasses (if you don't have food coloring just do 2-3 eggs in plain vinegar). 3. After 48 hours, drain the vinegar, add water and gently rinse the eggs. 4. Observe the eggs carefully and try to explain the changes. 5. Experiment with your eggs, push on them gently, and try to bounce them gently from different heights. 8. After finishing, dispose of your eggs and wash your hands well with soap. <p>Eggs sometimes contain bacteria that can be harmful.</p>
Science Behind It:	<p>Close observation is very important in this activity as it provides an excellent opportunity for students to use their observation skills. As students observe the production of gas bubbles on the shell, they may infer this as a sign of a chemical reaction (especially since no heat is added). In this case, a chemical reaction between the shell (made of calcium carbonate) and the acetic acid in the vinegar occurs. The resulting products include calcium acetate, water, and carbon dioxide bubbles that form on the shell.</p> <p>After 48 hours or so, you can carefully rinse the remaining products off the egg and what remains is the super cool, translucent membrane that encapsulates the rest of the egg. This super thin but super tough membrane is also semipermeable – it allows many materials to flow back and forth through the membrane according to differences in concentration. The flow of water through a semipermeable membrane is called osmosis. When the membrane is placed in water, water flows into it and the egg expands. You can test the toughness of this amazing membrane by dropping it from different heights until it POPS.</p>
Questions to Ask:	1. Based on your observations, do you think the reaction between the egg shell and the vinegar was a physical or a chemical change? Explain your thinking.