

GYSTC Activity



Title: Alka-Seltzer Rocket

Purpose:	Students will observe a chemical reaction when Alka-Seltzer (citric acid and sodium bicarbonate-baking soda) is placed in water producing bubbles of carbon dioxide gas.
Standard:	<p>S2P2. Obtain, evaluate, and communicate information to explain the effect of a force (a push or a pull) in the movement of an object (changes in speed and direction). a. Plan and carry out an investigation to demonstrate how pushing and pulling on an object affects the motion of the object. b. Design a device to change the speed or direction of an object. c. Record and analyze data to decide if a design solution works as intended to change the speed or direction of an object with a force (a push or a pull).</p> <p>S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces. a. Plan and carry out an investigation on the effects of balanced and unbalanced forces on an object and communicate the results. b. Construct an argument to support the claim that gravitational force affects the motion of an object. c. Ask questions to identify and explain the uses of simple machines (lever, pulley, wedge, inclined plane, wheel and axle, and screw) and how forces are changed when simple machines are used to complete tasks. (Clarification statement: The use of mathematical formulas is not expected.)</p> <p>S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects. a. Analyze and interpret data to identify patterns in the relationships between speed and distance, and velocity and acceleration. (Clarification statement: Students should be able to analyze motion graphs, but students should not be expected to calculate velocity or acceleration.) b. Construct an explanation using Newton's Laws of Motion to describe the effects of balanced and unbalanced forces on the motion of an object. c. Construct an argument from evidence to support the claim that the amount of force needed to accelerate an object is proportional to its mass (inertia).</p>
Materials:	Alka-Seltzer Duct tape Water Film canister

<p>Procedures:</p>	<ol style="list-style-type: none"> 1. Divide an Alka-Seltzer tablet into four equal pieces. 2. Fill the film canister half full with water. Note: Steps four through six have to take place very quickly or the rocket will blast off before you're ready. Read the next few steps first to make sure you understand what is going to happen. 3. Place one of the pieces of Alka-Seltzer tablet in the film canister and quickly snap the lip on the container. 4. Turn the film canister upside down and slide it (lid first) into the tube. 5. Point the open end of the tube AWAY from yourself and others and wait for the pop. Instead of the lid flying off, the bottom of the film canister shoots out of the tube and flies across the room.
<p>Science Behind It:</p>	<p>As the carbon dioxide is being released, it creates pressure inside the film canister. The more gas that is made, the more pressure builds up until the cap is blasted down and the rocket is blasted up. This system of thrust is how a real rocket works whether it is in outer space or here in the earth's atmosphere.</p>
<p>Questions to Ask:</p>	<p>What is a force? What causes the force in this lesson? What is Acceleration?</p>