

Amazing Air Puff Cannon

Simple STEM Activities You Can Do at Home

See a short video of the activity at: <https://youtu.be/5dw6qEqrSdA>

Purpose:	The purpose of this activity is to construct an air puff cannon, test to see how far the air travels and determine what objects can be moved by the force produced.
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.</p> <p>a. Plan and carry out an investigation to demonstrate how pushing and pulling on an object affects the motion of the object.</p> <p>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.</p> <p>S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces.</p> <p>a. Plan and carry out an investigation on the effects of balanced and unbalanced forces on an object and communicate the results.</p> <p>S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.</p> <p>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.</p>
Materials:	Box or 2 liter bottle, balloon or plastic bag, tape, small cups, thread or string, tissue or newspaper, paper towel rolls. Assorted light objects that you can find.
Procedures:	<ol style="list-style-type: none"> 1. Fold a piece of paper into quarters (1/4ths) and cut the paper along the folds into quarters. 2. Roll one of these pieces snugly around the straw. Tape the paper. 3. Fold over one end of the paper and tape it into the rocket nosecone. 4. Fold another color of paper in half. Cut fins out the paper. 5. Tape the fins to the bottom end of rocket. 6. Launch the rocket by blowing into the straw launcher. 7. Try seeing how far and high you launch the rocket.
Science Behind It:	A force is simply a push or a pull. Forces are needed to change the motion of objects – even tiny particles of air. Air is a gas made of a mixture of molecules. Like other gases, air particles expand to fill any container that they occupy. An air cannon works by applying a force quickly to the air particles contained within the cannon. When you push in on the sides of the box, the sides collide with air particles and push them toward the opening of the cannon. These air particles collide with other air particles setting off a kind of chain reaction. The only way for these fast moving air particles to escape is through the opening. The rapid movement of these particles forms a stream of air that flows quickly out of the cannon and across the room. How far away can you feel the puff?
Questions to Ask:	<ol style="list-style-type: none"> 1. Explain why a force is needed to change the motion of an object? 2. What factor could you change to improve the flight of your rocket?