

# Forces Can Help Things Fall

## Simple STEM Activities You Can Do at Home

<b>Purpose:</b>	The purpose of this activity is to investigate how objects move in different ways when forces are applied to the objects.
<b>Standard:</b>	<p><b>S4P3. Obtain, evaluate, and communicate information about the relationship between balanced and unbalanced forces.</b></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>b. Construct an argument to support the claim that gravitational force affects the motion of an object.</p> <p><b>S8P3. Obtain, evaluate, and communicate information about cause and effect relationships between force, mass, and the motion of objects.</b></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>
<b>Materials:</b>	Part 1: Small gemstone or penny, index card. Part 2: cup, raw egg, toilet paper tube, pie tin, clear cup, water, food coloring (optional).
<b>Procedures:</b>	<p>Part 1:</p> <ol style="list-style-type: none"> <li>Place your index card on top of your cup, and your gem in the middle of the index card.</li> <li>Quickly tweak the card with your finger and observe what happens.</li> <li>Using what you know about forces, explain why the gem falls into the cup.</li> </ol> <p>Part 2:</p> <ol style="list-style-type: none"> <li>Fill your cup about 3/4<sup>th</sup> full of water. Place the pie tin on top of the cup.</li> <li>Balance the toilet paper tube in the middle of the pie tin.</li> <li>Balance the egg sideways on top of the paper tube.</li> <li>Using the palm of your hand, quickly strike the pie tin sideways.</li> <li>Observe that happens to the egg.</li> <li>Using what you know about forces, explain why the egg falls in the cup.</li> </ol>
<b>Science Behind It:</b>	<p>Forces are interactions between objects that cause a push or a pull between them. We can use these pushes and pulls to move objects. In this activity, students apply a sideways force to an index card and pie tin to make each of them move horizontally. With these objects gone, the supporting structures are removed from both the gem and the egg and they are pulled into the cup by gravity.</p> <p>For middle school students, these activities illustrate Newton’s 1<sup>st</sup> Law which states that an object at rest remains at rest and an object in motion remains in motion unless an unbalanced force acts on it. While both the gemstone and the egg are at initially at rest, the removal of their supports allows the force of gravity to pull them to the bottom of the cup.</p>
<b>Questions to Ask:</b>	<ol style="list-style-type: none"> <li>Explain why a sideways force was needed to move an object down?</li> <li>Explain why the gem or egg didn’t move sideways with card or pie tin?</li> </ol>