
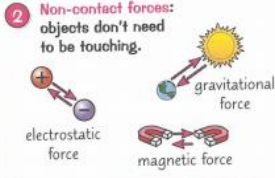
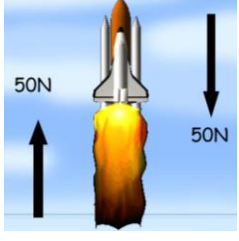
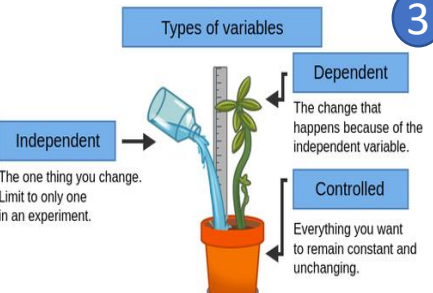
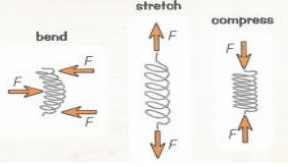
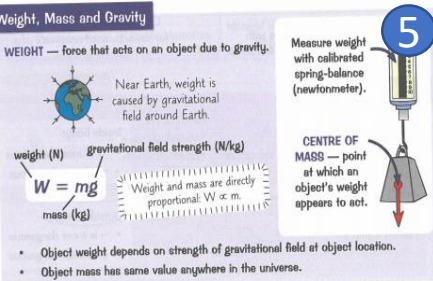


## Rationale

Engineers analyse forces when designing a great variety of machines and instruments, from road bridges and fairground rides to atomic forces that holds our universe together. Anything mechanical can be analysed in this way. To understand how something happens in our universe, we need to know the forces involved. Recent developments in artificial limbs use the analysis of forces to make movement possible.

Diagrams	Keywords	Definitions
<p><b>1</b> <b>Contact forces:</b> objects have to be touching.</p>  <p><b>2</b> <b>Non-contact forces:</b> objects don't need to be touching.</p> 	<p>Contact Force</p> <p>Non- Contact Force</p> <p>Newton</p>	<p>Forces applied with two or more interacting (touching) surfaces.</p> <p>When a force is applied but surfaces do not need to be interacting.</p> <p><b>The unit of a force named after Sir Isaac Newton who first defined Forces.</b></p>
	<p>Balanced Forces</p> <p>Unbalanced Forces</p> <p>Interaction pairs</p>	<p>Opposing forces are equal in size</p> <p>Opposing forces are not equal in size</p> <p>All forces work in pairs which are called <b>interaction pairs</b>.</p>
<p><b>3</b> <b>Types of variables</b></p>  <p><b>Independent</b> The one thing you change. Limit to only one in an experiment.</p> <p><b>Dependent</b> The change that happens because of the independent variable.</p> <p><b>Controlled</b> Everything you want to remain constant and unchanging.</p>	<ul style="list-style-type: none"> <li>Independent Variables.</li> <li>Dependent Variables</li> <li>Control Variables.</li> </ul>	<p>The thing that you change in an investigation.</p> <p>The thing that you measure/record in an investigation.</p> <p>The things that you have to keep the same in an investigation.</p>
	<ul style="list-style-type: none"> <li>Spring Constant</li> <li>Stretch</li> <li>Compression</li> <li>Elasticity</li> </ul>	
<p><b>5</b> <b>Weight, Mass and Gravity</b></p> <p>WEIGHT — force that acts on an object due to gravity.</p>  <p>Near Earth, weight is caused by gravitational field around Earth.</p> <p>Measure weight with calibrated spring-balance (newtonmeter).</p> <p><math>W = mg</math></p> <p>Weight and mass are directly proportional: <math>W \propto m</math>.</p> <p>CENTRE OF MASS — point at which an object's weight appears to act.</p> <ul style="list-style-type: none"> <li>Object weight depends on strength of gravitational field at object location.</li> <li>Object mass has same value anywhere in the universe.</li> </ul>	<ul style="list-style-type: none"> <li>Mass</li> <li>Weight</li> <li>Gravity</li> </ul>	<ul style="list-style-type: none"> <li><b>Weight</b> is a force which is measured in Newtons (N).</li> <li>Mass is an <b>amount</b> of a substance. It is measured in <b>kilograms</b> (kg).</li> <li><b>Gravity</b>, is a natural phenomenon by which all things with mass—including planets, stars, galaxies, and even light—are attracted.</li> </ul>