

## Balance and Motion Unit Design – Grade 1

Balance & Motion shows we live in a dynamic world where everything is in motion, or so it seems. But not everything is moving the same way. Some things move from one place to another. Other things go around and around in a rotational motion. Still other things are stationary, stable for a time, balanced on a thin line between stop and go. These are the global phenomena that students experience in this module

Grade 1

**RI Statements of Enduring Knowledge - (Established Goals):**

**PS 3 - The motion of an object is affected by forces.**

Related Rhode Island GSE's (Understandings)	RI Assessment Targets Assessment Evidence <b>***High Emphasis Targets</b>
<p><b>PS3 (K-2) –7</b>  <b>Students demonstrate an understanding of motion by...</b>  <b>7a</b> showing how pushing/pulling moves or does not move an object.  <b>7b</b> predicting the direction an object will or will not move if a force is applied to it.  <b>Students demonstrate an understanding of force by...</b>  <b>7c</b> showing that different objects fall to earth unless something is holding them up.</p> <p><b>PS3 (K-2)–8</b>  <b>Students demonstrate an understanding of (magnetic) force by ...</b>  <b>8a</b> observing and sorting objects that are and are not attracted to magnets.</p>	<p><b>***PS3 (K-4)-INQ+SAE –7</b>  <i>Use data to predict how a change in force (greater/less) might affect the position, direction of motion, or speed of an object (e.g., ramps and balls).</i>                      Investigation 2, Parts 1-3, pp. 8-25                      Investigation 1, Parts 1-4, pp. 8-28                      Investigation 3, Parts 1-3, pp. 6-25</p> <p><b>PS3 (K-4) INQ+ SAE –8</b>  <i>Use observations of magnets in relation to other objects to describe the properties of magnetism (i.e., attract or repel certain objects or has no effect)</i>                      Science Stories pp. 18-21</p>

Words in **bold** are important for science vocabulary development, and should be used for word walls.

Investigation-Time (45 min.periods)	Investigation	Focus Questions (Essential Questions)	Big Ideas (Understandings)
1.1-(3)	Trick Crayfish	<ul style="list-style-type: none"> <li>How many ways can a shape balance?</li> </ul>	<p>Objects can be <b>balanced</b> in many ways  <b>Counterweights</b> can help balance an object                      The way an object can be <b>balanced</b> can be changed by counterweighting</p>
1.2-(2)	Triangle and Arch	<ul style="list-style-type: none"> <li>How can counterweights help us balance other shapes?</li> </ul>	<p>A <b>stable</b> position is one that is steady; the object is not falling over                      The place on which an object balances is called the <b>balance point</b>  <b>Counterweights</b> should be placed low or below an object in relation to the <b>balance point</b></p>
1.3-(1)	The Pencil Trick	<ul style="list-style-type: none"> <li>How can a pencil be balanced on its point?</li> </ul>	<p><b>Counterweights</b> should be placed low or below an object in relation to the <b>balance point</b>                      The position of an object can be described by relating its location to another object</p>
1.4-(2)	Mobiles	<ul style="list-style-type: none"> <li>How do the parts of a mobile stay in stable positions?</li> </ul>	<p>A mobile is a system of balanced beams and objects</p>
2.1-(2)	Tops	<ul style="list-style-type: none"> <li>How can spinning tops be changed?</li> </ul>	<p>Objects and systems that turn on a central axis exhibit <b>rotational motion</b>                      You need a <b>force</b> to start a top spinning                      The amount and position of <b>mass</b> affect how the object <b>rotates</b></p>
2.2-(2)	Zoomers	<ul style="list-style-type: none"> <li>How can a spinning object be kept in motion?</li> </ul>	<p>There are different ways to initiate <b>rotational motion</b>                      The <b>motion</b> of an object can be changed by <b>pushing</b> or <b>pulling</b>                      Tops and zoomers both spin, but in different ways</p>
2.3-(2)	Twirlers	<ul style="list-style-type: none"> <li>How did the different shapes make the twirler move?</li> </ul>	<p>Variations in design can influence the <b>rotational motion</b> of spinning objects  <b>Air resistance</b> can act as the force that initiates <b>rotational motion</b></p>
3.1-(2)	Rolling Wheels	<ul style="list-style-type: none"> <li>How can a wheel and axle system be changed?</li> </ul>	<p><b>Wheels</b> roll down a slope                      A slope is a surface that is higher on one end than another  <b>Axles</b> support <b>wheels</b>  <b>Wheel-and-axle systems</b> with <b>wheels</b> of different sizes roll toward the smaller <b>wheel</b></p>
3.2-(2)	Rolling Cups	<ul style="list-style-type: none"> <li>Can we predict the behavior of the rolling cup?</li> <li>What happens if weight is added to a rolling cup system?</li> </ul>	<p>Cups roll in the direction of the smaller end                      To roll straight, two cups can be taped together so the ends are the same size                      The amount and location of an added weight can change the way a system rolls</p>
3.3-(1)	Rolling Spheres	<ul style="list-style-type: none"> <li>How can we make a runway that will keep a marble rolling?</li> </ul>	<p><b>Spheres</b> are round in all directions and roll in all directions                      A runway must be high at the start and low at the finish for a sphere to roll the complete length of the runway.                      Spheres roll down a slope</p>