

Roller Coaster Physics Unit: 7th Grade Challenge

Each student will receive a packet of worksheets/handouts on which they will record their work for the duration of the unit.

Monday	Tuesday	Wednesday	Thursday	Friday
<p>April 14</p> <p>Roller Coaster Unit begins</p> <p>Movie: eXtreme RollerCoasters</p> <p>Allow 5 minutes at end of class for students to write reflections in packet.</p> <p>(Start video from beginning. You won't have time to show it all in one day, but some of the best coaster are at the beginning anyway.)</p>	<p>April 15</p> <p>Vocabulary</p> <p>- Use board or overhead to write vocabulary words and definitions for students to write in their packets</p> <p>OR – Have the students look up the definitions on their own and then discuss each as a group</p>	<p>April 16</p> <p>Gravitational Force</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates gravitational force. Have students demonstrate and explain to the class what they have built.</p> <p>Possible results could include anything that makes the marble go from a higher point to a lower point because of gravity, such as a downward hill.</p> <p>Students should record their results in their packet.</p>	<p>April 17</p> <p>History and How They Work</p> <p>- Read and discuss the article "How Roller Coasters Work" from howstuffworks.com</p>	<p>April 18</p> <p>History and How They Work</p> <p>- Students will use the information in the "How Roller Coasters Work" article to complete the related page in their packet.</p>
<p>April 21</p> <p>Balanced and Unbalanced Forces</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates balanced and unbalanced forces. Have students demonstrate and explain to the class what they have built.</p> <p>Possible results could include a section of coaster where the marble comes to a stop (balanced).</p> <p>Students should record their results in their packet.</p>	<p>April 22</p> <p>Kinetic Energy</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates kinetic energy. Have students demo and explain to the class what they have built.</p> <p>Possible results could include a loop at the bottom of a hill (using energy from the hill to travel through the loop).</p> <p>Students should record their results in their packet.</p>	<p>April 23</p> <p>Friction</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates friction. Have students demo and explain to the class what they have built.</p> <p>Possible results could include using tape, tissue or some other material to create a section of track that slows the marble down.</p> <p>Students should record their results in their packet.</p>	<p>April 24</p> <p>Speed</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates speed. Students will calculate the speed of the marble through the track they build. Have students demo and explain to the class what they have built.</p> <p>Students should record their results in their packet.</p>	<p>April 25</p> <p>Speed</p> <p>- Based on their experiences the day before, the students will attempt to build a section of roller coaster on which their marble travels at a greater speed than they achieved the day prior. Have students demo and explain to the class what they have built.</p> <p>Students should record their results in their packet.</p>

<p>April 28</p> <p>Potential Energy</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates potential energy. Have students demonstrate and explain to the class what they have built.</p> <p>Possible results could include a marble at the top of a hill.</p> <p>Students should record their results in their packet.</p>	<p>April 29</p> <p>Momentum</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates momentum. Have students demo and explain to the class what they have built.</p> <p>Possible results could include a hill followed by a loop or long straight-a-way.</p> <p>Students should record their results in their packet.</p>	<p>April 30</p> <p>Centripetal Force</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates centripetal force. Have students demonstrate and explain to the class what they have built.</p> <p>Possible results could include any loop. (The marble is pushed toward the center.)</p> <p>Students should record their results in their packet.</p>	<p>May 1</p> <p>Newton's First Law of Motion</p> <p>- Students will use the foam tubing, wooden dowels, tape, and a marble to build a section of a roller coaster that demonstrates Newton's First Law of Motion. Have students demo and explain to the class what they have built.</p> <p>Possible results could include a marble that begins moving when hit by another marble.</p> <p>Students should record their results in their packet.</p>	<p>May 2</p> <p>Movie: "America's Greatest Roller Coaster Thrills" (Movie has a setting that allows you to view the entire coaster ride as if you were in the front seat. If showing the movie on a computer, right click to get the settings.)</p> <p>Suggestion: Let students choose which coasters to view.</p>
<p>May 5</p> <p>Roller Coaster Project</p> <p>- Build a "roller coaster" using foam tubing and tape</p> <p>- Work alone or with one partner</p> <p>- Roller Coaster should have at least one loop and one corkscrew</p> <p>- A marble should be able to travel from start to finish without falling off</p>	<p>May 6</p> <p>Build Roller Coaster (continue from Monday)</p>	<p>May 7</p> <p>Build Roller Coaster (continue from Monday)</p>	<p>May 8</p> <p>Build Roller Coaster (continue from Monday)</p>	<p>May 9</p> <p>Demonstrate Roller Coaster for the class and explain why you made it the way you did</p>

Pictures from 8th Grade Roller Coaster projects (how things might look):