

**TEKS Breakdown 6.8A** (supporting)

**Unit 4: Energy Transformations**

<p><b>TEKS Knowledge and Skills Statement</b></p>	<p>Force, motion, and energy</p> <p>6.8A The student knows <u>force</u> and <u>motion</u> are related to potential and kinetic energy.</p>					
<p><b>TEKS Student Expectation</b></p>	<p>The student is expected to...</p> <p><b>Compare</b> and <b>contrast</b> <b>potential</b> and <b>kinetic energy</b>.</p>					
<p><b>Verb(s) and Synonyms</b></p>	<table border="1"> <tr> <td data-bbox="410 678 678 978"> <ul style="list-style-type: none"> <li>• Compare</li> <li>• Contrast</li> <li>• Categorize</li> <li>• Illustrate</li> <li>• <b>Draw</b></li> <li>• <b>Conclusions</b></li> </ul> </td> <td data-bbox="678 678 943 978"> <ul style="list-style-type: none"> <li>• Model</li> <li>• Describe</li> <li>• Explain</li> <li>• Conclude</li> <li>• Analyze</li> <li>• <b>Composed of</b></li> <li>• <b>Comprise</b></li> </ul> </td> </tr> </table>	<ul style="list-style-type: none"> <li>• Compare</li> <li>• Contrast</li> <li>• Categorize</li> <li>• Illustrate</li> <li>• <b>Draw</b></li> <li>• <b>Conclusions</b></li> </ul>	<ul style="list-style-type: none"> <li>• Model</li> <li>• Describe</li> <li>• Explain</li> <li>• Conclude</li> <li>• Analyze</li> <li>• <b>Composed of</b></li> <li>• <b>Comprise</b></li> </ul>	<p>Level of Complexity (DOK)</p>	<p>2</p>	
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<b>Vertical Alignment (prior knowledge)</b>	<p><b>Prior: Students know that energy exists in different forms, including mechanical, light, thermal, electrical, heat, and sound (3.6A, 4.6A, 5.6A)</b>  <b>Push, pull, magnetism, gravity, friction, force, motion</b></p> <ul style="list-style-type: none"> <li>• <b>Supporting: energy transformations in living systems (7.7A,B),</b></li> <li>• <b>unbalanced forces change the speed and direction of an object (8.6A)</b></li> <li>• <b>8.6(C) investigate and describe applications of Newton’s three laws of motion, such as in vehicle restraints, sports activities, amusement park rides, Earth’s Tectonic activities, and rocket launches</b></li> </ul>
<b>Essential Knowledge</b>	<p><b>Students should know...</b></p> <ul style="list-style-type: none"> <li>- <b>KE and GPE are independent of one another.</b></li> <li>- <b>Kinetic energy is energy of motion and depends on the speed of the object (and its mass).</b></li> <li>- <b>Potential energy is energy that is stored due to position.</b></li> <li>- <b>Gravitational potential energy depends on the height (position) of the object and its weight (mass x gravity).</b></li> </ul> <p><b>When you review this concept, remember to:</b></p> <ul style="list-style-type: none"> <li>• <b>Provide opportunities for students to interpret energy as it relates to the law of conservation of energy with kinetic and potential energy.</b></li> <li>• <b>Vary the visuals and allow students to interpret changes in potential and kinetic energy in multiple scenarios.</b></li> <li>• <b>Compare and contrast kinetic and potential energy.</b></li> </ul>
<b>Key Vocabulary</b>	<p><b>Kinetic energy; potential energy; gravitational potential energy; speed; height, elastic potential energy, Law of Conservation of Energy</b></p>
<b>Notes/ Possible Misconceptions</b>	<p><b>This is foundational to understanding balanced and unbalanced forces</b>  <b>A common misconception is that kinetic energy depends on height or on gravitational potential energy and vice versa. Students may think when KE is high, GPE must be low and when KE is low, GPE must be high. Clarification: objects can have both KE and GPE at the same time, ex. An airplane in flight</b></p> <p><b>Going down from GPE, st’s believe that the midpoint has the &gt;KE</b>  <b>PE and KE can be destroyed</b></p> <p><b>Students may make the following mistakes:</b></p> <ul style="list-style-type: none"> <li>• <b>Thinking that potential and kinetic energy can be created or destroyed</b></li> <li>• <b>Not recognizing the relationship between potential and kinetic energy</b></li> <li>• <b>Thinking that potential energy does not change as a function of height</b></li> <li>• <b>Thinking that kinetic energy is changed by height</b></li> </ul> <p><b>STAAR Questions:</b>  <b>6.8(A) 2018 #21</b>  <b>6.8(A) 2016 #22</b>  <b>6.8(A) 2013 #19</b></p>

