



# Thomas Haney Secondary School

Science 10

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## LG #9: Energy Transformations

*(What I need to understand)*

### BIG IDEA: *Potential and Kinetic Energy*

#### Learning Standards:

Learning Standards:	
<p><b>Fundamental Knowledge</b> (what I need to know)</p> <ul style="list-style-type: none"> <li>☆ <b>Energy can be transformed</b> from one form into another.</li> <li>☆ The <b>two main types of energy</b> that impact our lives on a daily basis are <b>potential and kinetic energy</b>.</li> <li>☆ <b>Potential and kinetic energy are linked</b> and are often converted between in daily activities.</li> </ul>	<p><b>Curricular Competencies</b> (What I need to do)</p> <ul style="list-style-type: none"> <li>● <b>List</b> multiple forms of energy and <b>explain</b> how they can be converted.</li> <li>● <b>Describe</b> current structural technologies (structures) that use potential and kinetic energy and <b>explain</b> how the different forms of energy are linked.</li> <li>● <b>Demonstrate</b> an understanding of how a roller coaster converts potential and kinetic energy and how this proves conservation of energy.</li> </ul>

#### Assessment of Learning Standards:

Have an interview to show evidence of the **Learning Standards**, or elect to take a quiz

		MASTERY (A)
<p><b>ESSENTIALS (C/C+)</b></p> <p><b>I CAN:</b></p> <ul style="list-style-type: none"> <li>☆ <b>Describe</b> multiple (5) situations where energy is transformed from one type to another.</li> <li>☆ <b>Explain</b> how the movement of an object as it rolls down in an incline contains energy conversions.</li> <li>☆ <b>Define</b> friction and describe how it can be reduced and or eliminated in everyday activities.</li> </ul>	<p><b>ADVANCED (B)</b></p> <p><b>I CAN:</b></p> <ul style="list-style-type: none"> <li>➤ <b>Manipulate</b> the energy conversions a devices does in order to improve/change its functionality.</li> <li>➤ <b>Develop</b> a method to determine (without riding) whether at any point during a roller coaster course if energy is being lost or conserved.</li> </ul>	<p><b>I CAN:</b></p> <ul style="list-style-type: none"> <li>✓ <b>Design</b> an experiment which converts energy which is normally “wasted” into a form that is more useful.</li> </ul>

**Reflection:**

After finishing my learning activities what do I understand? How have I answered the BIG Question?

**OPTION 1**

Choose your own adventure:

- ☆ Pick up an Adventure proposal form from the Science Kiosk
- ☆ Create a plan, include what topics will be covered
- ☆ Get teacher approval for your plan before beginning
- ☆ Bring your approved plan and your evidence of learning to the LG interview

**OPTION 2**

- ☆ **Watch** the video on potential and kinetic energy AND complete the LG 9 Bozeman Science worksheet.  
  
[https://www.youtube.com/watch?v=BSWI\\_Zj-CZs](https://www.youtube.com/watch?v=BSWI_Zj-CZs)
- ☆ **Complete** the “Kinetic to Potential energy” lab.
- ☆ **Create** ten (10) practice problems (WITH ANSWERS) that focus on calculating kinetic (5) and potential (5) energy.
- **Complete** the “Challenge Questions” on the LG 9 Bozeman Science Worksheet.
- **Draw** a roller coaster course including height changes with potential energy calculations and maximum speeds (kinetic energy). Assume  $E_p = E_k$  aka no friction. Roller Coaster is 400 kg.
- ✓ A student in North Vancouver designed a flashlight that converts excess body heat into electric energy in order to power it. Using this as an inspiration to **design** a technology that makes a current technology more efficient and or ecofriendly.

**OPTION 3**

- ☆ **Read** the articles explaining kinetic:  
  
<https://www.khanacademy.org/science/physics/work-and-energy/work-and-energy-tutorial/a/what-is-kinetic-energy>  
  
And potential energy (gravitational):  
  
[http://www.ducksters.com/science/physics/potential\\_energy.php](http://www.ducksters.com/science/physics/potential_energy.php)
- ☆ **Complete** the “Kinetic to Potential energy” lab.
- ☆ **Complete** the worksheet about kinetic and potential energy.
- **Complete** the “Challenge Questions” on the LG 9 Bozeman Science Worksheet.
- Find AND reference a kinetic energy → potential energy simulator. (Try it out....ILL ASK QUESTIONS ABOUT IT)
- ✓ A student in North Vancouver designed a flashlight that converts excess body heat into electric energy in order to power it. Using this as an inspiration to **design** a technology that makes a current technology more efficient and or ecofriendly.