**Roller Coaster Activity**

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| **Subject Areas** | Comprehensive Science 1,2, and 3, Physical Science, and Physics  |
| **Grade Level(s)**  | 6th to 12th grade  |
| **Learning Objective(s)** | 1. Explain what potential gravitational energy is
2. Describe energy transformation and conservation in a close system
3. Analyze the relationship between potential gravitational energy and kinetic energy .
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1. **Vocabulary Activity. Go to dictionary.com and look for the definition of the following words. Then, write a sentence with the word.**

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| **Vocabulary word** | **Definition** |
| **Potential energy** |  |
| **Gravitational potential energy** |  |
| **Kinetic energy**  |  |
| **Mechanical energy**  |  |
| **Law of conservation of energy** |  |

1. **Calculating potential energy and kinetic energy**

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1. What is the potential energy of an object with a mass equal to 2.5 kg that is located 8.6 meters above the ground?

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| **List** | **Formula and calculations** | **Answer** |
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1. What would happen to the potential energy if the object is placed only 4 meter above the ground?

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1. What would be the velocity of the object right before touching the ground?

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| **List** | **Formula and calculations** | **Answer** |
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**3. Reflection Questions.**

1. What happens to the velocity of the marble when you increase the height of the first drop?

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1. Why is always the first loop the biggest one? What would happen if you design a roller coaster in which the last loop is the biggest one? Why?

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