

## Background Information:

### *Potential Energy of Marbles*

*In this activity, you and your group will design a ramp to investigate how height can change the potential energy of an object. This design must include a data table suitable for recording the distance a marble rolls down a ramp positioned to begin at different heights. Your group will run multiple trials of each condition you want to test. You will apply scientific inquiry methods through repeated trials to construct a table to organize your data in your notebook.*

## Safety Precautions:

- Follow all lab safety guidelines.

## Materials List:

Per group:

- Paper-towel tube
- Meter sticks, two
- Marbles, three of different sizes
- Ruler
- Masking tape
- books with different thicknesses

## Safety Concerns

Identify any safety equipment and concerns that need to be observed in this lab.


## Key Question

What was the question that you wanted to answer?

*Directions:* Write the question for the investigation. The question should be specific and be able to be investigated.

Key Components

- Specific (one general thought, does not combine two or more questions)
- Is able to be investigated

## Hypothesis

<b>Claim that answers your question based on the evidence</b>	<i>Directions:</i> Develop a claim about what you think is going to happen.
	<u>Key Components</u> <ul style="list-style-type: none"><li>• Expresses a cause and effect relationship</li><li>• Is testable</li><li>• Incorporates prior knowledge</li></ul>

# Student Investigation Sheet

## Plan

How Will You Investigate the Question?	<i>Directions:</i> Describe the plan that you will use to study your question and analyze your hypothesis.
	<p><u>Key Components</u></p> <ul style="list-style-type: none"><li>• Plan is easily repeatable by others</li><li>• Plan describes the use of materials</li><li>• Plan is in a logical order</li></ul>

# Student Investigation Sheet

## Data

Evidence from this investigation	<i>Directions:</i> Record all of the evidence that has been collected. Evidence can be any data that helps answer the question appropriately and completely. The focus of this section is on what was found during the investigation.
	<p><i>Key Components</i></p> <ul style="list-style-type: none"><li>• Data (from an investigation and/or other sources, such as observations, reading material, archived data, etc.)</li><li>• Appropriate (data applies directly to the question)</li><li>• Sufficient (uses enough data to completely answer the question and determine a finding on the hypothesis)</li></ul>

## Conclusion

Summarize Your Findings	<p><i>Directions:</i> Develop a conclusion for your investigation. The conclusion should contain clear thoughts and vocabulary that has been studied. This section focuses on the answer to the question and either proving or refuting the hypothesis. This should be done by linking the hypothesis to the data using logical reasoning.</p>
	<p><u>Key Components</u></p> <ul style="list-style-type: none"><li>• Use precise and accurate language</li><li>• Use scientific vocabulary</li><li>• Provide clear logical thoughts</li><li>• Use evidence and reasoning to support or refute the hypothesis</li></ul>

## Analysis and Conclusions

1. What factors might affect your results, especially when comparing your results with those of other groups?

2. How can you use height to change the potential energy of an object?

3. How will the distance an object moves be related to its original potential energy?