

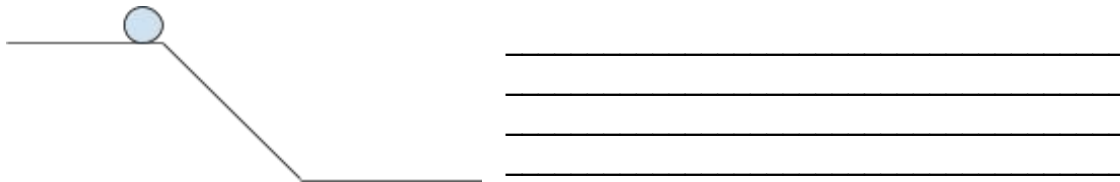
## Investigation: Marble Coaster

### Introduction

Mechanical energy can be described as the ability to do work. Mechanical energy can be either kinetic energy (energy of motion) or potential energy (stored energy of position). There are two types of mechanical potential energy: elastic and gravitational. Elastic potential energy is the energy stored in a stretched or compressed spring or in a stretched rubber band. Through this investigation, you will look for the relationship between kinetic energy and gravitational potential energy, and design an experiment to determine an answer to the following question:

*How does the position of an object on a track affect its velocity?*

**Hypothesis:** State your hypothesis and explain your reasoning.



### Procedure:

Develop a procedure in order to test your hypothesis and number your steps below. You can add more steps or draw diagrams to clarify if needed. **Check your procedure with your teacher before you start the experiment!** Materials available: [include pictures]

- Photogates
- Tracks
- Marbles
- Meter sticks

Independent Variable: \_\_\_\_\_

Dependent Variable: \_\_\_\_\_

Control(s): \_\_\_\_\_

1.

2.

3.

4.

5.

6.

7.

**Observations:**

Use the Photogate software to record the data for your independent variable and dependent variable. Write any qualitative observations below.

Using your data, describe the relationship between your selected independent and dependent variables. Draw a diagram if needed.

**Data Analysis:**

1. Construct a graph from the data you collected.
2. Use the regression tool to determine a function to fit your graph.
3. Save your data to a google spreadsheet and share it with an email address provided by your teacher.

**Questions:**

After class discussion

1. Make a claim: How does the position of an object on a track affect its velocity?

2. How does your hypothesis relate with your claim?

3. Use your data to justify your claim.