Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_ Hr \_\_\_\_\_

## Activity 1.2 - *What happens to energy when objects collide?*

#### **Part 2 –** Changes in motion and energy

**Materials**

* 2 marbles with the **same size** and **mass**

**Investigate**

Try rolling the marbles toward each other. Note what happens to the speed and direction of each marble when they collide. Test each of the following at least 3 times.

1. Set one marble in place and roll the other marble toward it.
2. Roll both marbles toward each other with the same initial speed.
3. Roll both marbles toward each other with different initial speeds.
4. Method of your choice.

For every test you run, record your observations about the motion of ***each marble*** before and after the collision. \*\*No need to record mass and size, we already set that information!\*\*

|  |  |  |
| --- | --- | --- |
| **Test Type** | **Observations of motion BEFORE collision** | **Observations of motion AFTER collision** |
| 1 | Slow speed | \_\_\_\_\_\_\_\_\_ speed, \_\_\_\_\_\_\_ direction |
| 1 | Medium speed |  |
| 1 | Fast speed |  |
| 2 |  |  |
| 2 |  |  |
| 2 |  |  |
| 3 |  |  |
| 3 |  |  |
| 3 |  |  |
| 4 |  |  |
| 4 |  |  |
| 4 |  |  |

**Data Analysis**

Make energy graphs for any of the above collisions that you tested in TEST 1. When making your graph, be sure to decide the following:

* + What to include in the system
  + The relative kinetic energy before and after the collision
  + How to represent the change

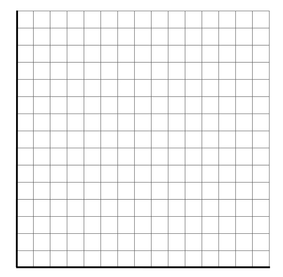
**Data Analysis**

What type(s) of energy are involved in the collision of the marbles? Explain

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_What things are included in the system?

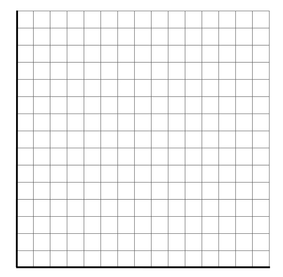
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**GRAPH 1:** Make a BAR graph to show the change in kinetic energy for **marble 1** (the marble that was in place) and **marble 2** (the marble that was rolled) before and after they collided in **TEST 1.** Include all speeds - slow, medium and fast.



Summarize a pattern or trend in your data in sentence form:

**GRAPH 2:** Make a BAR or LINE graph to show the change that speed has on the amount of kinetic energy for marble 1 (the one that was in place) after the collision in **TEST 1 in all three speeds** - slow, medium and fast.



Summarize a pattern or trend in your data in sentence form: