OLD SALEM EXPLORATORIUM

Mass, Marbles, and Motion

Grade 5 Science

Name: _____ Date: _____

In the *Knock Out!* video, you learned about the game of marbles. In this activity, you will investigate the science behind the game. This activity is best done on the floor or on a large table. You will work with a partner or in a group and will need the following:

- A standard-sized marble
- A "shooter" (a larger marble)
- A long cardboard tube
- 3 textbooks
- A stopwatch (such as found on a personal electronic device)

PART 1: INVESTIGATING THE FORCE OF GRAVITY

You will time how long it takes for the **standard-sized marble** to roll down the cardboard tube. You will use different amounts of textbooks to raise your cardboard tube to different heights.

Use this table to record your results, then answer the questions below.

NUMBER OF TEXTBOOKS USED	TIME IT TAKES MARBLE TO EXIT TUBE (in seconds)
1	
2	
3	

1. What happens as you increase the number of textbooks? _____
_____
_____

2. Why does this happen? (Use the word "gravity" in your response.) _____
_____
_____

3. How long do you think it would take the marble to exit the tube if you put one end of the cardboard tube on top of 6 textbooks? _____
_____

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PART 2: INVESTIGATING THE EFFECT OF MASS

Now you will time how long it takes for the **"shooter"** to roll down the cardboard tube.

Use this table to record your results, then answer the questions below.

NUMBER OF TEXTBOOKS USED	TIME IT TAKES MARBLE TO EXIT TUBE (in seconds)
1	
2	
3	

1. What are the differences between the first marble you used and the "shooter"? _____
_____
_____

2. How are the results using the "shooter" different from the results using the standard-sized marble? _____
_____
_____

3. What do you think would happen if you used a marble with a mass twice as much as that of the "shooter"? _____
_____
_____

PART 3: CONCLUSION

Using what you have learned in this investigation, list two things that can affect an object's motion.

1. _____

2. _____