Name: _____ Date: _____

Slowing Movement

There are four steps involved in this project. You have to complete each step in order. You will have four periods to complete the project, so you need to get one step done each period.

- Step 1: Initial Testing – Determine how long it takes a ball to drop.
- Step 2: Designing – Design something to slow the ball when it is dropping.
- Step 3: Building – Build your design to slow the ball.
- Step 4: Final Testing – Repeat the initial test, but with your design in place.

Step 1: Initial Testing

Equipment:

- Sponge Ball
- Timer

Procedure:

1. Stand on your desk – BE SURE TO FOLLOW SAFETY RULES.
2. Hold the sponge ball at shoulder height.
3. Drop the sponge ball to the floor.
4. Time how long it takes to drop to the ground.
5. Repeat the drop two more times.
6. Record all three times in the chart below.
7. Use a calculator to do the calculation below.

Observations:

Drop Number	Time (s)
1	
2	
3	

Add all three times:
_____ + _____ + _____ = _____

Divide the total by 3:
_____ ÷ 3 = _____

This is the average time!

Step 2: Designing

You need to design something that can help slow down the ball as it falls to the ground. These are the rules:

- You can not damage the ball.
- You can tape something to the ball.
- You can use paper, string, tape, straws, popsicle sticks or play clay.
- You can use other supplies, but you MUST ask your teacher first.

Make a labelled drawing of your design in the box below.

List all of the supplies you will use in the table below.

Supply	Number

Supply	Number

Step 3: Building

With your design idea complete, you are now to build the design using the supplies you listed. If you have to make changes to your design, make sure you change your drawing.

Step 4: Final Testing

Equipment:

- Sponge Ball
- Timer
- Your Design to Slow the Ball

Procedure:

1. Attach your design to the sponge ball.
2. Stand on your desk – BE SURE TO FOLLOW SAFETY RULES.
3. Hold the sponge ball with your design at shoulder height.
4. Drop the sponge ball with your design to the floor.
5. Time how long it takes to drop to the ground.
6. Repeat the drop two more times.
7. Record all three times in the chart below.
8. Use a calculator to do the calculation below.

Observations:

Drop Number	Time (s)
1	
2	
3	

Add all three times:
_____ + _____ + _____ = _____

Divide the total by 3:
_____ ÷ 3 = _____

This is the average time!

When you are done all of your experimenting, individually answer the questions on the back of this page.

Slowing Movement Questions

1. Use a calculator to do the calculation below.

   Subtract the average time from your initial test from the average time from your final test.

   _____ - _____ = _____ This is the amount of time you slowed the ball down!
   (final) (initial)

2. What force caused the ball to fall to the floor?

   _____

3. Why did your design slow down the ball? What forces were involved?

   _____

   _____

   _____

   _____

4. Were the forces balanced on the ball? Explain.

   _____

   _____

   _____

5. What would happen if the forces were balanced?

   _____

   _____

   _____

6. How would you change your design to slow the ball even more?

   _____

   _____

   _____

   _____