#### Station 1: Ball Roll

#### <u>TRIAL 1</u>

Step 1: LARGE BALL

-Pluck ball with your finger.

-Record how far ball rolls (count floor tiles: 1 tile = 1 foot)

Step 2: SMALLER BALL

-Pluck ball with your finger. Use same amount of strength as before.
-Record how far ball rolls (count floor tiles: 1 tile = 1 foot)

#### TRIAL 2

-Repeat steps 1 and 2 from above for BOTH balls, but plucking HARDER.Try to keep the same for each ball.-Record distance.

#### TRIAL 3

-Repeat steps 1 and 2 from above for BOTH balls, but plucking HARDEST. Try to keep the same for each ball. -Record distance.

#### Analyze the data.

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

Which ball rolled the farthest? Give more than 1 reason for this result and explain the effect.

#### Station 2: Ball Drop

#### <u>TRIAL 1</u>

Step 1: LARGE BALL

-Drop ball from knee height. Stand next to wall in order to measure. -Record how high ball bounces (Place sticky arrow on wall. Label 1.)

Step 2: SMALLER BALL

-Drop ball from knee heigth. Stand next to wall in order to measure. -Record how high ball bounces (Place sticky arrow on wall. Label 2.)

#### TRIAL 2

-Repeat steps 1 and 2 from above for BOTH balls, dropping from <u>WAIST</u> height.

-Record data.

#### TRIAL 3

-Repeat steps 1 and 2 from above for BOTH balls, dropping from <u>SHOULDER</u> height. -Record data.

#### <u>Analyze the data.</u>

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

Which ball bounced the highest? Give more than 1 reason for this result and explain the effect.

#### Station 3: Super Stack



#### TRIAL 1

Step 1: Stack 2 pieces on top of each other.

Step 2: Using a ruler, hit bottom piece sharply / quickly from the side.

Step 3: Record results.

#### TRIAL 2

Step 1: Stack 4 pieces on top of each other.Repeat steps 2 from above.-Record results.

#### TRIAL 3

Step 1: Stack 6 pieces on top of each other.Repeat step 2 from above.-Record results.

#### Analyze the data.

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

Station 4: Penny Catch

You need: penny and your elbow



1. Stack a penny on the end of your elbow.

- 2. Try to catch it with the same hand.
- 3.Repeat 3 times.
- 4. Record your data.
- 5.Now, repeat the above with 3 pennies, then 5.

#### <u>Analyze the data.</u>

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

Station 5: Chain Reaction

# You need: 20 dominos and your hand



- 1. Set dominos in a pattern on the floor  $\frac{1}{2}$  inch apart from each other.
- 2. Push the domino on the end with one finger.
- 3. Repeat with a different pattern.

#### <u>Analyze the data.</u>

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

# Station 5: Collisions

# You need: newspaper, tape, small ball, large ball

- 1. Roll newspaper into 2 tubes and lay them down parallel to each other to create a track to roll the balls between.
- 2. Make sure the tubes are far enough apart to roll the large ball between them.
- 3. Tape the newspaper to the floor.
- 4. You and your partner will "crash" two balls on the track. To do this, take two balls and place each at opposite ends of the track. You and your partner will flick the balls so they move toward the center of the track and collide. When performing these experiments, you and your partner should flick the balls with the *same* force at the *same time*. \*Practice flicking the balls before you begin recording data.
- 5. After you and your partner feel comfortable flicking the balls, begin the first set of experiments.
- 6. First, crash two small balls. Then crash two large balls. Finally, crash a small ball with a large ball. Observe how the motion of each ball changes during each experiment. Draw a picture to show what happens and record your observations in the table on the recording sheet.

#### <u>Analyze the data.</u>

What were the <u>independent variables</u> in the activity? ("I" changed...) What was the <u>dependent variable</u> in the activity?

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

#### Newton's 3 Laws of Motion

1 <sup>st</sup> Law of Motion	2 <sup>nd</sup> Law of Motion	3 <sup>rd</sup> Law of Motion
An object at rest tends to stay at rest unless acted upon by something.	An object's acceleration depends on the mass and the force acting	For every reaction there is an equal but opposite reaction.
An object in motion tends to stay in motion unless acted upon.	on it.	If an object exerts a force on another object, then the second object exerts a force back in the opposite direction on the first object.

For each station, record the data and answer the questions.

STATION 1: BALL ROLL

Trial	Large Ball	Small Ball
1		
2		
3		

Independent variable: \_\_\_\_\_

Dependent variable:

Which ball rolled farthest? Give more than one reason for this result and the effect.

Which of Newton's 3 Laws of Motion can be applied to this scenario. Explain how. (Could be more than 1).

**STATION 2: BALL Drop** 

Trial	Large Ball	Small Ball
1		
2		
3		

Independent variable: \_\_\_\_\_

Dependent variable:	
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Which ball bounced the highest? Give more than one reason for this result and the effect.

#### Which of Newton's 3 Laws of Motion can be applied to this scenario. Explain how. (Could be more than 1).

#### STATION 3: Super Stack

Trial 2	
Trial 3	

# Independent variable: \_\_\_\_\_\_ Dependent variable: \_\_\_\_\_\_

Which of Newton's 3 Laws of Motion can be applied to this scenario. Explain how. (Could be more than 1).

#### STATION 4: Penny Catch (put a check if you caught it and an X if you didn't)

	1 penny	3 pennies	5 pennies
Trial 1:			
Trial 2:			
Trial 3:			

Independent variable:	
Dependent variable:	

#### STATION 5: Chain Reaction-Describe what happened for each trial

Trial 1	
Trial 2	
Trial 3	

Independent variable: \_\_\_\_\_

Dependent variable: \_\_\_\_\_

Which of Newton's 3 Laws of Motion can be applied to this scenario. Explain how. (Could be more than 1).

#### STATION 6: Collisions

	Illustration	Written Observation
Small vs. Small		
Large vs. Large		
Small vs. Large		

Independent variable:	
Dependent variable: _	