

Name _____ Date _____ Block _____

Newton's First Law of Motion Activities

1. Activity One: Magic Trick

Directions:

Center an index card over the top of a glass, & place the coin in the middle of the index card (on top might be a good place). Flick the card from the side. Try it several times.

Describe what happens in three complete sentences

Use Newton's first law of motion to explain why the coin falls into the cup if you remove the card quickly.

Explain why pulling on the card slowly will not work even though the coin has inertia. (Hint: Friction is a force.)

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2. Activity Two: Currency Exchange

Directions:

- a. Stack five of the washers, one on top of the other, so that you form a tower of washers.
- b. Aim the remaining washer at the bottom of the stack of washers and give it a good hard flick with your finger so that it heads straight for the bottom washer on a direct collision course.

Use Newton's first law to describe what happens in three complete sentences

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3. Activity Three: Catching Washers

Directions:

- a. Place three washers on your arm. Do your best to arrange them in a straight line.
- b. As quickly as you can, move your hand forward. Try to catch the washers before they fall on the ground.

Use Newton's first law to describe what happens in three complete sentences

Challenge: How many washers can you balance on your arm and still catch them?

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4. Activity Four: The Magic Thread

Directions:

- a. Cut a piece of thread about 40 cm long. Tie the thread around the bottom of the mass.
- b. Pull gently on the end of the thread. Observe what happens, and record your observations.
- c. Stop the mass from moving. Now hold the end of the thread so that there is a lot of slack between your fingers and the mass.
- d. Give the thread a quick, hard pull. You should observe a very different event. Record your observations. Throw away the thread.
- e. Use Newton's first law of motion to explain why the result of a gentle pull is different from the result of a hard pull. (Write in complete sentences).

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5. Activity Five: Newton rips off Galileo

Directions:

- a. Hold the track in a U shape so that the lowest part just touches a tabletop or floor. Measure & record the vertical distance from the tabletop to the top of one end of the track.
- c. Drop the marble at the top of the end of the track you've measured.
- d. Watch what the marble does. Notice where it stops the first time before it goes back in the opposite direction. Measure & record this vertical distance.
- e. Run this trial five times.
- f. Now change the shape of the track so the second die of the U is lowered a bit. Look at figure 1.6)
- g. Record the starting height again.
- h. Drop the marble at the top of the end of the track you've measured.
- i. Watch what the marble does. Notice where it stops the first time before it goes back in the opposite direction. Measure & record this vertical distance.
- j. Run this trial five times.
- k. Now lower the second side of the U even more & repeat steps f – j.
- l. Finally, make the track into a L and record the height of the one side.
- m. Drop the marble at the top of the end of the track you've measured.
- n. Watch what the marble does.
- o. Repeat twice.
- p. Answer questions

Data Table

Trial	U Side 1 Height	At what height did the marble stop?
1		
2		
3		
4		
5		

Trial	L Side 1 Height	How far away did the marble stop?
1		
2		

Questions:

1. Please make a rule based on how the marble behaved.

2. With the L shape track, the marble never reaches it's vertical distance. If there was no friction or wall, how long would the marble continue to roll? _____
Explain.

3. Now, just for fun... using your ramp and marble see if you can get the marble to go into a cup on the floor.
 - a. Write the procedure you used to figure out the puzzle.

Draw a diagram of your successful ramp.