Physical Science Newton's First Law of Motion Date Period
KJHS Name

Part One LAW OF INERTIA

Materials

- Plastic cup
- Index Cards
- Pennies

Procedure

1. Place the card flat on top of the cup.
2. Place one penny on top of the card so it is in the center.
3. Carefully flick the card straight and hard. If done properly, the card will move, but the objects will fall into the beaker.
4. See how many pennies you can place on the card and still have them fall into the cup.

Questions

A. How many pennies could you successfully get to fall into the cup?_____

B. Use your physics vocabulary and explain why the penny DID NOT always fall into the cup?

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C. Using your physics vocabulary explain why the penny fell into the cup when the card was flicked. *10 word minimum*

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Part Two

Materials

- 8 washers

Procedure

1. Stack five of the washers, one on top of the other, so that you form a tower of washers.
2. Aim one of the remaining washers 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. Repeat this until you get repeated results.
   What happens?_____
   _____
3. Using the same materials, but this time use two washers to flick into a stack of stationary washers.

Draw your set-up.	What happened?

A. Explain your observations in terms of Newton's 1st Law? **Use term UNBALANCED FORCE in answer**

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Part Three: Seat Belts Save Lives

Materials • matchbox car • clay • ramp • tape • pencil • textbooks

Procedure

1. Make a ramp by elevating one end of the ramp onto two books.
2. Tape a ruler perpendicular to the ramp about 2 car lengths from the end of the ramp.
3. Use the clay to make a **snowman** type figure.
4. Flatten the bottom and gently set it on the hood of the car (**do not press** it onto the car).
5. Position the car at the top of the ramp, release and allow it to roll down to collide with the ruler.

A. What happens to your "guy"?_____

6. Recreate the experiment to answer the following question:

★★★★★★★★★★★ *You should repeat your experiment several times* ★★★★★★★★★★★

★★★★★★★★★★★ *to make sure the first attempt is not a fluke.* ★★★★★★★★★★★

B. What happens to your "guy" as the **height** of the ramp is increased?

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C. What happens to your "guy" if he has **more mass** (add clay)?

_____

D. Remove added mass. What happens to your "guy" if he wears a **"seatbelt"** (tape)?

_____

E. Remove seatbelt. What happens to your "guy" if you move **the ruler further away?**

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F. Draw a diagram for one of your favorite experiments.

a. In your diagram ★ label these terms ★ and include the direction (vector) →

• **Gravity** • **Friction** • **Normal Force** • **Net force**

Explain Newton's First Law of Motion. Do not just state the law.

Explain: **1)** which object stayed in motion and why **2)** mention which object is affected by an unbalanced force **3)** what object creates the unbalanced force. **PARAGRAPH FORM**

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