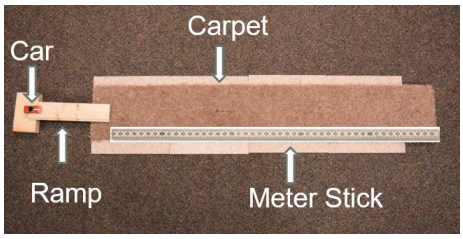
Name: _____ **Date:** _____

Does the Surface Matter?

Step 1: Make a Prediction

In this investigation, you'll place a toy car at the top of a ramp and let it go without pushing it or exerting any other force. When the car reaches the bottom of the ramp, you'll measure how far it travels over three different surfaces. First, the car will roll over carpeting. Next, the car will roll over tile. And last, the car will roll over rough sandpaper.



1. Do you think the car will travel the same distance over all three surfaces? Write your predictions below.

2. Why do you think this will or won't happen?

Step 2: Collect Data

1. Set up your ramp with a strip of carpet just like the ramp in the picture on page 1. Place the meter stick at the bottom of the ramp along the side of the carpet.

2. Let the car roll down the ramp and over the carpet. Using the meter stick, measure how far the car traveled from the bottom of the ramp to the front of the car. Then record the distance on the data table under Trial 1 (Carpet row).

3. Repeat this **two more times** and record the distances on the table under Trial 2 and Trial 3 (Carpet row). Compare the distances in Trial 1, Trial 2, and Trial 3. Circle the middle distance and record that number in the last box of the row.

4. Set up the ramp so the car will roll over the tile on the floor. Let the car roll down the ramp and over the tile. Using the meter stick, measure how far the car traveled from the bottom of the ramp to the front of the car. Then record the distance on the data table under Trial 1 (Tile row). Repeat this **two more times**. Measure and record the distances under Trial 2 and Trial 3. Then compare all three distances, circle the middle distance, and record that number in the last box of the row.

5. Set up the ramp with the strip of sandpaper (on the opposite side of the tile). Let the car roll down the ramp and over the sandpaper. Measure how far the car traveled from the bottom of the ramp to the front of the car. Record the distance on the data table under Trial 1 (Sandpaper row). Repeat this **two more times**. Measure and record the distances under Trial 2 and Trial 3. Compare all three distances, circle the middle distance, and record the number in the last box of the row.

Data Table

Surface	Distance Trial 1	Distance Trial 2	Distance Trial 3		Middle Distance
Carpet					
Tile					
Sandpaper					

Step 3: Summarize the Data

On which surface did the car travel the greatest distance? _____

On which surface did the car travel the shortest distance? _____

Step 4: Record Your Data

Add your data to the class data table.

Step 5: Explain Your Ideas

1. Why do you think the car traveled different distances over the three surfaces?

_____

_____

_____

_____

2. If forces make an object start to move, do they also have something to do with making an object stop moving? Complete this sentence:

   I think forces [do/do not] have something to do with making an object stop moving because …

   _____

   _____

   _____

   _____

   Use evidence from your investigation to explain your answer. (**Hint:** In this investigation, did anything push or pull the car to make it stop moving?)