Friction Lab

Objective: You will be making the car go down the ramp to see how friction affects how far the car will go.

Part A Steps:

1. Place the binder on floor with the skinny edge down.

2. You will be making the car go down the “ramp” (binder) and measuring how far the car goes. Measure from the edge of the binder to the end of the car to keep it consistent. DO NOT PUSH THE CAR! This adds a variable to the experiment because one student might push the car harder than another student. Let gravity do the work.

3. Release the car at the top of the binder and then measure how far it goes. Then record the measurement on your data sheet

4. Next add a piece of sandpaper to the bottom of the binder. Open the binder and place a bit of the sandpaper in the binder. Most of the paper will be sticking out. This is to create a smooth transition from the binder to the sandpaper. Have the car go down the ramp, measure and record on your data sheet.

5. Repeat step 4 with waxpaper, carpet, foil, sand and sandpaper.

**Question/Problem:** Which type of material will create the least amount of friction for a car when it is going down a ramp?

**Hypothesis:** I think that \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ will have the least amount of friction.

**Table 1 Results:**

|  |  |
| --- | --- |
| Type of material: | How far the car went: |
| Plastic (Binder Cover) plain surface |  |
| Sand paper |  |
| Wax paper |  |
| Foil |  |
| Carpet |  |
| Sand |  |

**Conclusion:**

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ had the least amount of friction.

**(Circle one)** My hypothesis was correct incorrect

Part B Steps

1. Now add 1 penny to your car and use your binder without an additional surface. Record your results and repeat.
2. Repeat step 1 by adding 3 pennies and then 5 pennies.

Table 2 results Effects of Weight on Friction (Static Friction)

|  |  |  |  |
| --- | --- | --- | --- |
| Trials | 1 penny | 3 pennies | 5 pennies |
| Trial #1 |  |  |  |
| Trial #2 |  |  |  |
| Trial #3 |  |  |  |

Answer the following questions:

1. Describe how the force of friction changes between smooth and rough surfaces.
2. Describe the difference between Kinetic Friction (different surfaces) and Static Friction (different weight).
3. Explain why Kinetic Friction is less than Static Friction
4. Explain how the force of Friction changes as the weight pushing the surfaces together changes.
5. As speed increases with your car, what happens to the air resistance? Why?
6. If you increase the amount of friction between two surfaces, what happens to temperature? Of all the materials used, which one do you think would cause the most increase in temperature? Why?