

Rough or Smooth Surface

Which has More Friction?

Problem

- How will the rough and the smooth surfaces affect the amount of force it takes to move the object?

Variables

- Independent Variable (The surface)
- Dependent Variable (The amount of force it takes to move the object)
- Control Variables
 - 1: Mass of the object
 - 2: The surface of the object
 - 3: The distance the object has to move
 - 4: The speed that the forces apply.
 - 5: The method by which the forces is applied.

Hypothesis

- If rougher surfaces make it harder for two objects to slide. Then it will take more force to move the objects. Because rougher surfaces have more friction.

Materials

- Friction blocks (plain wood), (felt), (sandpaper coarse), and (medium grit.)
- Test Frame
- A surface that I pull against (Paver)
- Wire cables (One M meter)
- One weight (Two Kg)
- Digital force Gauge/meter :does (N) and (Kg)
- Data recording sheet and pen

Procedure

1. Prepare data collection sheet, make a list of how much friction there is and of each friction block.
2. Make a chart that has each friction block and the amount of friction.
3. Hook the friction block to the test frame.
4. Place the weight (another paver) on top of the friction block.
5. Hook the Digital force Gauge/meter to the friction block.
6. Apply force until the friction block moves.
7. Record the peak reading from the friction Gauge/meter on my data sheet.
8. Repeat steps two-six, two more times.
9. Repeat steps two-seven for each of the four friction materials I'm testing.
10. Analyze data and draw conclusions.

Procedure Continued

11. Then repeat all steps until I have about 6 amount of trials
12. Record all data as follows
13. Write down each type of block, Lacquered wood, Felt, Medium Grit sandpaper, and Coarse sandpaper.
14. Then write down trials 1-6
15. Record all data with an N for (Newtons) next to your measurements

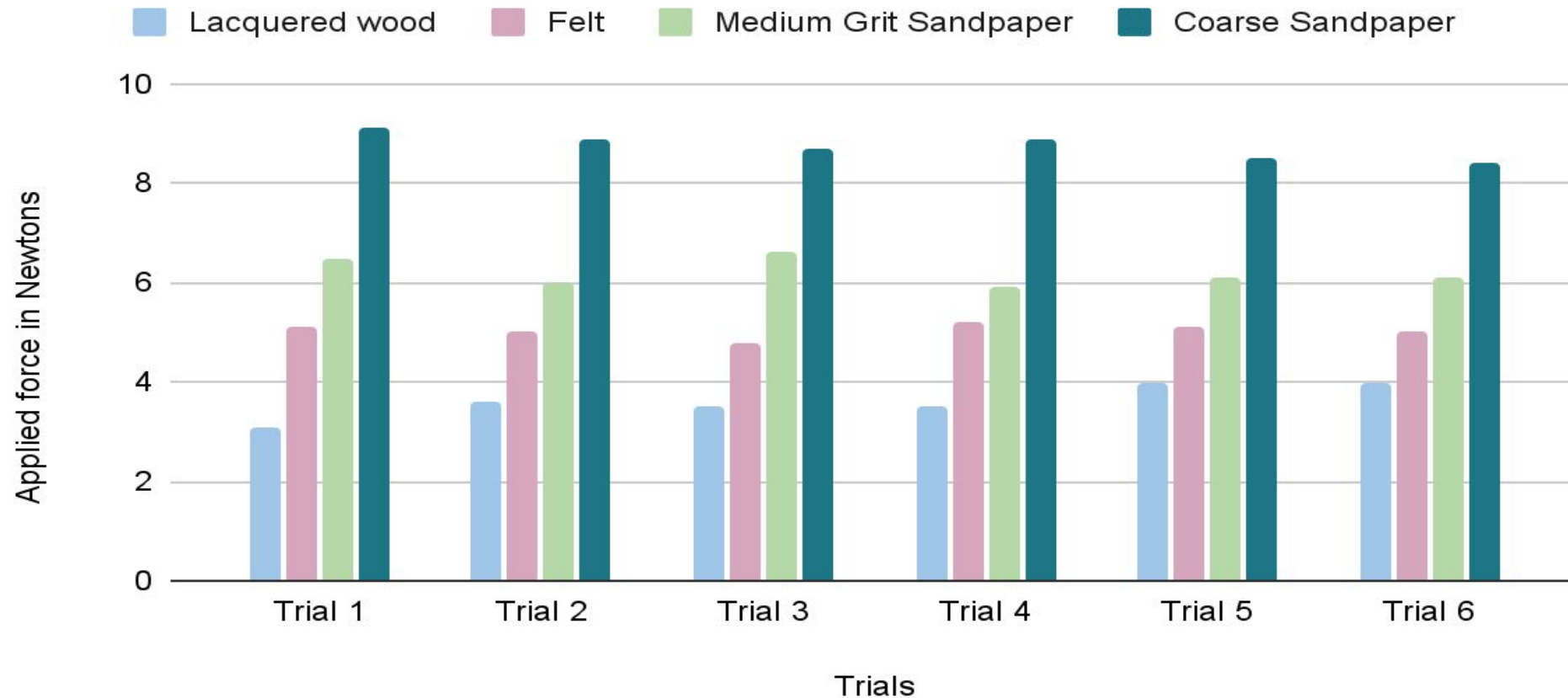
Data Collection Table

	Trial 1	Trial 2	Trial 3	Trial 4	Trial 5	Trial 6
Lacquered Wood 1	3.1	3.6	3.5	3.5	4.0	4.0
Felt 2	5.1	5.0	4.8	5.2	5.1	5.0
Medium Grit Sandpaper 3	6.5	6.0	6.6	5.9	6.1	6.1
Coarse Sandpaper 4	9.1	8.9	8.7	8.9	8.5	8.4

- Applied force in Newtons

Data Analysis Graph

Amount of Newtons on Different Surfaces



Data Analysis

- Following the Procedure outlined on slides 5 and 6, I recorded the data as shown on slide 7.
- All six trials show that the coarse sandpaper had the most friction with the average friction being 8.8 N force required to move the block.
- All six trials show that the medium grit sandpaper was the second most friction with an average friction of 6.2 N force required to move the block.
- All six trials show that Felt had the second to the least friction with an average friction of 5.0 N force required to move the block.
- All six trials show that the Lacquered block had the least friction with an average of 3.6 N force required to move the block.
- A pattern that I saw was that the Coarser of the surface that I tested, the higher the friction.

Pictures of the Experiment



Conclusion

- My hypothesis was accepted because the medium grit sandpaper and the coarse sandpaper had the most friction during the experiment. This proved that rougher surfaces have more friction than smooth surfaces.
- In my data, it shows that the Coarse sandpaper and the Medium Grit sandpaper had the most friction when moved. The Coarse sandpaper had the most friction of 8.8 N force required to move the block.
- The Medium Grit sandpaper had shows that it had the second highest amount of friction of 6.2 N force required to move the block.
- I learned how to figure out how much friction that could happen depending on the type of different surfaces.

Conclusion

- Friction -A force that opposes motion between surfaces in contact. Force- A push or pull on an object that can change its motion.
- If I were to do this project again, I would not change anything because my data was correct and the testframe worked pretty well.
- If I did not properly sand the test frame, the blocks wouldn't have slides as smooth because there would be too much friction in the frame. Then my data would be incorrect.
- If we didn't have the eye at the end, then the string would take too much force and the data would be all wrong.

Application

- This project has an impact on people because, people need to know what type of surfaces to use when they want objects to be able to move and what type to use when they don't want objects to move.
- If I were to extend this project, I would test different materials to find a surface that would prevent the block from moving. Or one that the block would move with almost no force. I could also try using different weights on the sample blocks to see how the weight affects the force needed to move the block.

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