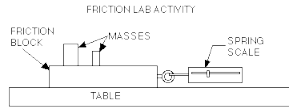


Student Activity: Friction: What a Drag!



Name _____
Date _____
Period _____ Table _____

Friction: What a Drag!

Background: Friction is a resistant force between two surfaces that are in contact with each other. The four types of friction are static, sliding, rolling, and fluid.

Static friction is the force that acts on objects that are not moving; extra force is required to start the motion of these stationary objects. This is the force measured just before the objects begin to move.

Sliding friction occurs when two objects slide past each other. In this activity the measurement of this force will remain constant once steady motion has been maintained.

Purpose: to observe the effects of surface area, surface type, and weight on frictional forces.

Materials:

- | | | |
|-----------------------|----------------------------|--------|
| wood friction block | smooth surface | slider |
| spring scale (Newton) | rough surface (sand paper) | cloth |

Procedure:

Part I: Surface Area

- Place the wooden block (flat side) on a smooth surface and attach the spring scale to the eyelet.
- Pull the block until the movement is a steady motion. Observe and record both the static friction and the sliding friction.

Static friction is: _____ N Sliding friction is: _____ N

- Repeat 1 and 2, but this time turn the wooden block on its side (thin edge)

Static friction is: _____ N Sliding friction is: _____ N

Part II: Surface Texture

- Repeat 1 and 2 on the different surfaces provided and record the static friction and sliding friction of each

Surface Texture	Static Friction (N)	Sliding Friction (N)
Sandpaper		
Cloth		

Part III: Effect of Weights

- Place the flat side of the wooden block on a smooth surface and attach the spring scale to the eyelet.
- Pull the block until the movement is a steady motion. Observe and record both the static friction and the sliding friction.
- Place a 100 gram weight on the block of wood and repeat 1 and 2.
- Repeat 1-2 using 200 grams; 300 grams; 400 grams; and 500 grams.

Added Weight	Static Friction (N)	Sliding Friction (N)
None		
100 grams		
200 grams		
300 grams		
400 grams		
500 grams		

Part IV: Changing the Contact Surface

1. Place the flat side of the wooden block on a cloth surface and attach the spring scale to the eyelet. Add a weight of your choice.
2. Pull the block until the movement is a steady motion. Observe and record both the static friction and the sliding friction.
3. Place the flat side of the wooden block on a slider and place both on a cloth surface and attach the spring scale to the eyelet. Add the same weight of your choice. Record both the static friction and the sliding friction.

Weight is: _____ g	Static Friction (N)	Sliding Friction (N)
Weight no slider		
Weight + slider		

Analysis and Conclusion:

1. From your observations, what is the difference between static forces and sliding forces?
2. Do you think a static force always occurs when two non-moving objects in contact with each other are put into motion? Explain why you think this.
3. What effect does surface area have on frictional forces?
4. Write a statement that explains the relationship between texture (smooth vs rough) and frictional forces.
5. Why was the slider used in this activity?
6. In the “real world” how would sliders be used?
7. Is friction always a good thing? Explain in detail your answer.