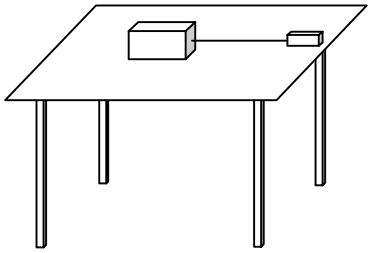
Name: **Hr:** **AP Physics C Friction Lab**

Static and Kinetic Friction Lab

Aim of this lab is to study Static and Kinetic Frictional forces between various surfaces and the effect of area of contact, mass and external forces on them.

- Attach a force probe to 3 kinds of blocks by a string – plastic base, Cork base and Felt base.
- Place a single metal block on the block each time. Slowly increase the pull on the block until it will move. Once the block is moving, pull so the block has a constant speed. Record the force that was necessary to get the block moving and the force necessary to keep the block moving at a constant speed.
- Repeat the same with 2 metal blocks.



Repeat the experiment for each of the four sides of the block.

Surface Material and Area	Block + Single Metal		Block + Two Metal Blocks	
	Force to get the block to move	Force to move the block at a constant speed	Force to get the block to move	Force to move the block at a constant speed
Plastic				
Felt				
Cork				

Calculations: Calculate the Coefficients of Static and Coefficient of Friction from the observed experimental data for each case.

Analysis: (No need to write the questions in your lab notebook. Just answer them well enough so a lay person could understand)

1. Draw the free body diagram for the block.

2. Is there a relationship between the force needed to get the block to move and the force needed to keep it moving at a constant speed? If so, what is it?

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3. Is there a relationship between the type of surface material and the force needed to get the block to move? If so, what is it?

4. Is there a relationship between the type of surface material and the force needed to keep it moving at a constant speed? If so, what is it?

5. Is there a relationship between contact area and the force needed to get the block to move? If so, what is it?

6. Is there a relationship between contact area and the force needed to keep it moving at a constant speed? If so, what is it?

7. Is there a relationship between weight of the block and the force needed to get the block to move? If so, what is it?

8. Is there a relationship between weight of the block and the force needed to keep it moving at a constant speed? If so, what is it?

9. What would change if the block were pushed directly down by an outside force?

10. What would change if the block were pulled directly up by an outside force?

11. What would change if the force were at an angle to the horizontal?

12. What would change if the block were placed on an inclined plane?|

13. What would change if the block were pulled up an inclined plane at a constant speed?

14. What did you find about the Static and Kinematic Force of Friction in the case of plastic, felt and cork surfaces interacting with the table surface.