

F R I C T I O N L A B

5 - 4 - 3 - 2 - 1

A PRE LAB MYSTERY LAB Presented IN PART by DR. RACHENBACH w/ Assists by Mr. Settle

<u>Observations</u>	<u>Inference</u>	<u>Actual Explanation</u> (if different than your inference)

Materials: Blocks of wood, Various boards with different textures, Newton Scale, Round colored Pencils

NOTE: USE 2 IRON BLOCKS or BOOK on top of the wood you pull for all experiments to add mass to block.

ACTIVITY #1

IV = Rough or Smooth sliding surface

DV=Force needed to pull

Experiment Design: (1 – 2 sentences)	Diagram A B
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RESULTS

Smooth Surface FORCE NEEDED TO PULL = _____	Rough Surface FORCE NEEDED TO PULL = _____
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SUMMARY STATEMENT (1 well written sentence summarizing what this experiment showed)

Explain what happens to sliding friction as the surface gets more rough

REAL LIFE APPLICATIONS:

Come up with a couple real life reasons (or examples) we would make surfaces smooth to decrease friction 1. 2.	Come up with a couple real life reasons (or examples) we make surfaces rough to increase friction: 1. 2.
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“Mastery” Quality: Why do you think smooth surfaces create less friction?

A C T I V I T Y #2

IV = MASS (heavy / light)

DV=Force needed to pull

Note: You have been putting mass on the block each time. Now you need to design an experiment where you change the mass of the block by adding or subtracting mass from the block.

Experiment Design: (1 – 2 sentences)	Diagram A B
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RESULTS

LIGHT MASS FORCE NEEDED TO PULL = _____	HEAVY MASS FORCE NEEDED TO PULL = _____
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SUMMARY STATEMENT (1 well written sentence summarizing what this experiment showed)

Explain what happens to friction as mass increases.

“A” Quality --> REAL LIFE APPLICATIONS:

Come up with a couple real life situations where increasing the mass of an object is beneficial because of the increase in friction. 1. 2.	Come up with a couple real life situations where having a small mass of an object is beneficial because of the decrease in friction. 1. 2.
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“Mastery” Quality: Why do you think adding mass increases friction between surfaces?

A C T I V I T Y #3

IV = ROLLING FRICTION and SLIDING FRICTION

DV=Force needed to pull

NOTE: Using round colored pencils can create something for the block to roll on. Use a rough surface for the sliding friction part. Be sure to always keep weight on your wood block like 2 iron pieces for the whole lab.

Experiment Design: (1 – 2 sentences)	Diagram A B
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RESULTS	
<u>WITHOUT PENCILS (sliding friction)</u> FORCE NEEDED TO PULL = _____	<u>WITH PENCILS (rolling friction)</u> FORCE NEEDED TO PULL = _____

SUMMARY STATEMENT (1 well written sentence summarizing what this experiment showed)
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REAL LIFE APPLICATIONS: Think of some inventions where we use rolling friction as a way to reduce friction in a system 1. 2.
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“Mastery” Quality: why do you think rolling friction is less than sliding friction.
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A C T I V I T Y #4

IV = STATIC vs SLIDING

DV=Force needed to pull

NOTE: Use the square blocks with padding instead of the other blocks and add 2 iron blocks to the top of it for the entire experiment.

Experiment Design: (1 – 2 sentences)	Diagram A B
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RESULTS 1

<u>STATIC</u> FORCE NEEDED TO PULL = _____	<u>SLIDING</u> FORCE NEEDED TO PULL = _____
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RESULTS 2

Repeat this but add additional mass to the blocks (like another iron block)

<u>STATIC</u> FORCE NEEDED TO PULL = _____	<u>SLIDING</u> FORCE NEEDED TO PULL = _____
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SUMMARY STATEMENT (1 well written sentence summarizing what this experiment showed)

REAL LIFE APPLICATIONS:

Think of scenarios (or inventions) in real life that show that sliding friction is less than static friction

1.

2.

"Mastery" Quality: Why do you think sliding friction is less than static friction.

CONCLUSION QUESTIONS	CONCLUSION ANSWER COMPLETE SENTENCES as IF QUESTION IS NOT THERE.
1. WHAT IS GREATER (STATIC OR SLIDING FRICTION)?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
2. What evidence in the lab do you have for you answer above?	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
3. DESCRIBE WAYS FRICTION CAN BE HELPFUL AND WAYS IT CAN BE HARMFUL. (PP 123)	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
4. WHAT ARE SOME WAYS TO REDUCE FRICTION (PP123-124)	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
5. WHAT ARE SOME WAYS TO INCREASE FRICTION?(PP 124)	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>
6. ANSWER QUESTION 20 IN YOUR TEXT BOOK (PP133)	<hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/> <hr/>