NAME_____

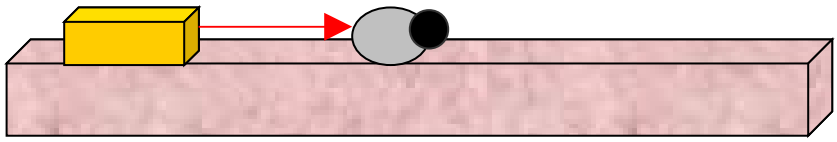
FRICTION

INTRODUCTION:

What does the force of friction depend on? Many of the factors people typically mention are: type of surfaces, surface area, velocity, and the mass of the object. Your job is to collect data on each of the previous mentioned "factors" and determine which friction actually depends on.

OBJECTIVE: To determine what factors affect friction and how they do so.

DIAGRAM:



PROCEDURES:

Nature of Surface in Contact

1. Place the small block of wood on the cardboard strip on the sheet provided and tape a 100-gram mass to the top. Attach a spring scale to the hook on the block and practice pulling the block **horizontally** *at a constant speed.* Record the average force meter reading in the space provided.
2. Repeat the procedure above with the block on the other surfaces.

Speed of Object

3. Choose a surface (or the tabletop) and investigate the effect speed has on friction by pulling the block at slow, medium, and fast speeds. Please repeat your trials many times until you are convinced one way or the other. Record your average force reading in the table.

Surface Area

4. Once again, choose a surface as control and this time investigate whether or not the surface area in contact has any affect in the resulting frictional force. Place the block on its edge and then side and repeatedly check for differences in the force as you more than quadruple the surface area. Please record your findings.

Mass of Object

5. With all other variables constant, vary the mass resting on the block and record your for-cc results.

DATA & ANALYSIS:

Material type	Force (N)	Speed	Force (N)	Surface area	Force (N)	Mass added (g)	Force (N)
Cork		Slow		Face			
Cardboard		Medium		Edge			
Rubber		Fast		-			
Sandpaper		-		-			

QUESTIONS:

1. How does the force of static (starting) friction compare to the force of kinetic (moving) friction? Think of the last time you had to push something very heavy.
2. Friction is the force which opposes motion and is generally considered a *hindrance*. List some examples of it in action as a *positive*.

3. The coefficient of static friction between rubber tires and dry pavement is 0.85 while the coefficient of kinetic friction between these materials is 0.67. Determine the forces of friction acting on your car (mass = 2000.kg) when you a) start from a stoplight, and b) hit the brakes to stop for a deer.

CONCLUSIONS:

Summarize your findings in paragraph format making sure to state how you believe each of the variables investigated affects (or does not affect) friction.