FRICTION LAB - period ____ Names _____

Purpose: This lab is designed to calculate the coefficient of friction (μ) for various surfaces, and to determine what factors increase or decrease friction.

Materials: Two spring scales: (1) 10 N (brown) and (1) 5 N (green)
1 friction block (smooth, no marks - keep it that way!)
1 friction pad
1 500 g weight

Procedure: Place the friction block (flat surface down) on the smooth cardboard surface of the friction pad and place the 500 g weight on top of the block. Attach the green spring scale to the hook on the friction block and gently pull until the block begins to move. Note the scale reading (Newton side, not grams). Keep the block moving slowly at a fairly constant speed, and again note the scale reading. If the reading at any time goes beyond the scale, substitute the brown scale for the green one. Repeat the procedure for each of the four surface types and for your desk top. Since at a constant speed $F_f = F_a$, the scale reading is in effect your friction force. Measure your normal force by suspending your friction block from the spring scale and reading the weight (Newton Side!). Don't forget to add the weight of the 500 g mass. Put all your equipment back more neatly than you found it, and work on the rest of the lab.

$$\mu = \frac{F_f}{F_N}$$ <---- sliding friction
<---- Total Normal Force

Data:			Calculations:
Surface Type	Starting Ff	Sliding Ff	Coefficient of Friction
Cardboard			
Cork			
Black Stuff			
Sandpaper			
Tabletop			

Weight of block +	Weight of 500g weight	= Total Normal Force

Conclusions:

1. What relationship did you notice between the type of surface and its coefficient?

So what is that coefficient number really telling me?

2. How did the startup friction compare with the sliding friction?

3. Why was the startup friction greater than the sliding friction? What else is involved?

4. Pretend there was another step to the procedure. Pretend you changed the weight on top to a 1 kg weight instead. Would the coefficients of friction change?
Why or why not? Would the force you pull with change? How?

Estimate what applied force you would need to pull this imaginary setup at a constant speed.

Cardboard	Cork	Black Stuff	Sandpaper	Tabletop

5. Startle me here with a dramatic, all-encompassing concluding statement of what you learned here: