**Friction lab – cPhysics**

Purpose – to observe how much force it takes to slide an object over a surface to determine the force of friction between those two objects.

Background

Friction exists between surfaces – glass on glass, tires on the road, your socks on the carpet, your paper on your desk. How much friction exists between difference surfaces? You can get an idea of the force of friction by trying to pull an object across a surface and observing how much force you need to move it at a constant velocity. In this lab you are going to slide a wood block across various surfaces and determine which has the most friction and resistance.

Hypothesis –

Take a look at the materials you are going to slide the wood block across (shown in **BOLD**). Which surfaces do you think will have the most friction with the wood block? The least? Why?

Materials –

Wood block

**Lab table**

**Rubber mat**

**Sand paper**

**Paper**

**Cardboard**

Meter stick

Spring scale

Paper covered brick

Paper covered sponge

Triple beam balance

Yarn or string

Procedure: part 1

1. Gather all materials
2. Use the triple beam balance to record the mass of your wood block. Record this on your data table
3. Put a meter stick on a lab desk.
4. Place your wood block at 0cm.
5. Loop the spring scale hook through the yarn on your block
6. Slowly pull on the spring scale to get the block moving. Pull the block at a constant velocity from the 0cm mark on the meter stick to the end of the meter stick. (HINT – you can tell if you are moving at a constant velocity if your spring scale stays in one place as you pull i.e. 42g) **There are different size spring scales, switch scales if you need to use one that measures more force!**

Wood block at 0cm

Spring scale

Meter stick

1. **Do this as many times as it takes to be fairly sure your results are accurate and then record the spring scale reading in your data table**
2. Repeat steps 4-7 for the other surfaces (paper, cardboard, rubber mat, sandpaper)

Procedure – part 2

1. Use the triple beam balance to find the mass of the paper covered brick and the paper covered sponge. Record these masses in your data table
2. Get a spring scale reading for the brick sliding across the lab table using the same process you did in part one. Record your data.
3. Get a spring scale reading for the sponge sliding across the lab table using the same process you did in part one. Record your data

Data and calculations-

|  |  |
| --- | --- |
| Object | Mass on triple beam balance (g) |
|  |  |
|  |  |
|  |  |

|  |  |
| --- | --- |
| Surface /wood block | Spring scale reading when block moving at constant velocity |
| Lab table |  |
| Sandpaper |  |
| Cardboard |  |
| Rubber mat |  |
| Paper |  |

Table Surface/paper covered brick spring scale reading \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Table surface/paper covered sponge spring scale reading \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lab Questions:

1. Look at your wood block data. Which surface combination (i.e. wood/paper) has the most friction? The least? Was your hypothesis right or wrong? Explain.
2. Draw a force diagram showing the forces acting on the wood block when it is at rest.
3. Draw a force diagram showing the forces acting on the wood block when it is in motion
4. Look at your data for the paper covered brick and the sponge. Which required more force to move it across the table?
5. Since both the sponge and the brick were moved across the same surface, what is the reason one required more force than the other? Explain.
6. What type of friction was acting against you as these objects were in motion?

Conclusions and summary – Write at least one paragraph discussing the concepts of this lab and your data. Include some examples of friction in the real world. What kinds of things can reduce friction?