**Coefficient of Friction Lab**

Name:

Block:

If a block is sliding to the right on a horizontal surface at a constant velocity -   
with friction - the free body diagram will look like this:

Since it is traveling at a constant velocity its **acceleration = 0** and hence:

**Fnet = Fapp – Ff = ma = 0,** thus

**Fapp = Ff**

**Procedure:**

1. Obtain all necessary materials.
2. Determine the weight of your friction block.
3. Pull the friction block (wood side down) at a constant speed across each of the required surfaces. Each time note the amount of force required to move at a constant velocity in the data table below.

**Data:**

Table 1: Kinetic Friction

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Surface | Fapp | Ff | FN ( = Weight) | μ |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

**Sample Calculations: (show ALL work)**

Show how you determined µ for one surface:

**Questions:**

1. a. Which surface had the greatest kinetic coefficient of friction?

b. Based on what you know about friction explain why this is so.

1. Does pulling the block at different speeds affect the friction on it? Explain.

Plot a graph of **Force of Friction vs. Normal Force**

Table 2: Kinetic Friction of wooden block on table (added weight)



|  |  |  |
| --- | --- | --- |
| Added Mass | FN  (Total Weight) | Ff |
| 0 g |  |  |
| 100g |  |  |
| 200g |  |  |
| 300g |  |  |
| 500 g |  |  |

**Sample Calculations: (show ALL work)**

Draw a best fit line and determine its slope (include units):

What does the slope represent?

**Questions:**

1. How does adding weight on top of the block affect the force of friction?
2. How does the amount of surface area in contact affect the force of friction?

Explain how you tested your hypothesis.

1. Why was it important to pull the friction block at a constant velocity?
2. Why was it important to pull the friction block along a horizontal surface?