Friction on an Angle Lab Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**-Purpose-** To be able to explain what factors affect the coefficient of static friction between 2 surfaces.

**-PART 1 Procedure-**

1. Measure the mass of a wood block

2. Place the wood block on a ramp

3. Change the angle of the ramp until it begins to slide

4. Measure the angle of the ramp at the point it began to slide

5. Redo steps 1-3 two times for a total of 3 trials.

6. Calculate the average angle for your block

7. Repeat steps 1-6 for the large block.

**Data**

**Mass of Small Block**=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Mass of Large Block**=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| SMALL BLOCK TRIAL # | Ramp Angle | LARGE BLOCK TRIAL# | Ramp Angle |
| 1 |  | 1 |  |
| 2 |  | 2 |  |
| 3 |  | 3 |  |
| Average Angle |  | Average Angle |  |

**Calculations**

$$θ$$

$$θ$$

$$θ$$

1. Find the **average** pull force on each block needed to make it slip down the ramp from the equation

Pull Force = mg (sin$θ$)

Small Block Pull Force= Large Block Pull Force=

1. How should the **pull force found in #1** compare to the **maximum static friction on each block**? (Hint, forces are balanced right until it starts moving)
2. **Using your answers from #1 and #2** what is the maximum force of static friction on each block?

Small Block Max Static Friction= Large Block Max Static Friction=

1. Using the **Max Static Friction from #3** solve for the coefficient of static friction µs for each block from the equation **Mac Static Friction = µsFn** Remember Fn = mg(cos$θ)$

Small Block Max Static Friction=

 Large Block Max Static Friction=

**Questions**

1. How does the coefficient of static friction of the small block compare to the coefficient of static friction for the large block?
2. What kind of errors where present in this lab and how did the affect your results? Be specific!!!!
3. How does mass and surface area affect the coefficient of friction between two surfaces? How does your data support this?

**-PART 2 Procedure-**

1. Redo Steps 1-6 for the metal block

**Data**

**Mass of Metal Block**=\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

|  |  |
| --- | --- |
| METAL BLOCK TRIAL # | Ramp Angle |
| 1 |  |
| 2 |  |
| 3 |  |
| Average Angle |  |

**Calculations**

1. Find the **average** pull force on the metal block.

1. What is the maximum force of static friction on the metal block?
2. What is the coefficient of static friction for the metal block?

**Questions**

1. How does the coefficient of static friction of the metal block compare to the wooden blocks?
2. What factors affect the coefficient of friction between 2 surfaces? How does your data support this?