

Procedure:

1. The spring balance was used to find the force of gravity on the block in Newtons.
2. The spring scale was attached to the wooden block using the hook attached to the block.
3. In Part 1, the block was placed on the table with the grooved side up.
4. The spring scale was used to pull the block in a straight line so that the block moved at a constant speed (Started with a gentle pull and increased pull gradually until it moved with constant speed). This force was recorded in the data table.
5. Step 4 was repeated with masses added to the top of the block.
6. In Part 2, the block was placed on the table with the grooved side down and steps 4 and 5 were repeated.
7. In Part 3, the block was wrapped in a material to change the contact surface and steps 4 and 5 were repeated

Part 1: Grooved Side Up

|  |  |  |
| --- | --- | --- |
| Weight of Added Mass | Static Applied Force  (Just Before Block Starts To Move) | Kinetic Applied Force (Block Moving At Constant Velocity) |
| 2 N (m=200 g) |  |  |
| 5 N (m=500 g) |  |  |
| 7 N (m=700 g) |  |  |

Question: Are the applied forces proportional to the weight of the block? Provide an explanation.

Question: How does the static applied force compare to the kinetic applied force? Propose an explanation for why they are different

Part 2: Grooved Side Down

|  |  |  |
| --- | --- | --- |
| Weight of Added Mass | Static Applied Force  (Just Before Block Starts To Move) | Kinetic Applied Force (Block Moving At Constant Velocity) |
| 2 N (m=200 g) |  |  |
| 5 N (m=500 g) |  |  |
| 7 N (m=700 g) |  |  |

Question: Compare applied forces for Part 1 and Part 2. Does surface area affect the applied force? Provide an explanation.

Part 3: Another Surface

|  |  |  |
| --- | --- | --- |
| Weight of Added Mass | Static Applied Force  (Just Before Block Starts To Move) | Kinetic Applied Force (Block Moving At Constant Velocity) |
| 2 N (m=200 g) |  |  |
| 5 N (m=500 g) |  |  |
| 7 N (m=700 g) |  |  |

Question: Compare applied force for Part 1-2 and Part 3. Does the type of surface (roughness) affect the applied force? Provide an explanation.

Friction Notes:

1. List the two factors that ***do*** affect friction.
2. List two factors that ***do not*** affect friction.
3. Define Static Friction:
4. Define Kinetic Friction:
5. Can kinetic friction ever be greater than static friction? Explain why or why not.