

Lab: The affect of mass on kinetic friction

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Testable Question:

How does the mass on an object affect its kinetic friction

Independent (Manipulated) Variable:

Mass of the object

Dependent (Responding) Variable:

Kinetic friction.

Controlled Variables:

- Material
- Surface
- Velocity of object
- Same person pulling

Expected Results:

The more weight the higher the kinetic friction.

Procedure (Include a sketch):

① Find the mass of each object

#1: 179.0g

#2: 210.6g

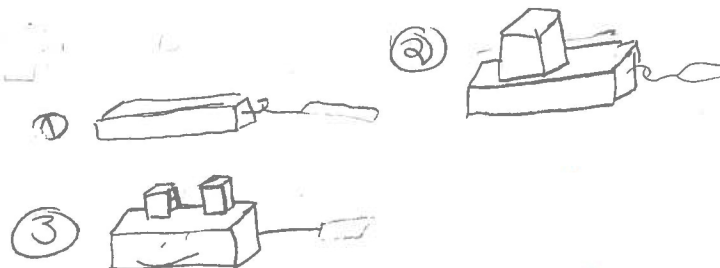
#3: 309.9g

② attach spring scale to object #1 and measure kinetic friction.

③ repeat for every object

④ record in observation table

⑤ find coefficient of friction



Observations (a table is the clearest way to present):

Object	Trial 1	Trial 2	Trial 3
#1 long wood block	0.3 N	0.35 N	0.35 N
#2 long wood with cube on top	0.55 N	0.6 N	0.6 N
#2 long wood with 2 blocks on top	0.9 N	0.9 N	0.85

Calculations:

$$F_n = F_g \quad g = 9.8 \quad M_1 = 119.0g \quad M_2 = 210.6g \quad M_3 = 309.9g$$

$$F_{n1} = 1166.2 \quad F_{n2} = 2063.9 \quad F_{n3} = 3037.0$$

$$\mu_{k1} = \frac{0.33}{1166.2} \quad \mu_{k2} = \frac{0.58}{2063.9} \quad \mu_{k3} = \frac{0.88}{3037}$$

$$\mu_{k1} = 0.00028 \quad \mu_{k2} = 0.00028 \quad \mu_{k3} = 0.00028$$

$$\mu_{k1} = 2.8 \times 10^{-4} \quad \mu_{k2} = 2.8 \times 10^{-4} \quad \mu_{k3} = 2.8 \times 10^{-4}$$

Conclusions:

Even though masses are different, the coefficient of friction will stay the same, kinetic friction increases as mass increases, so they are directly proportional.