

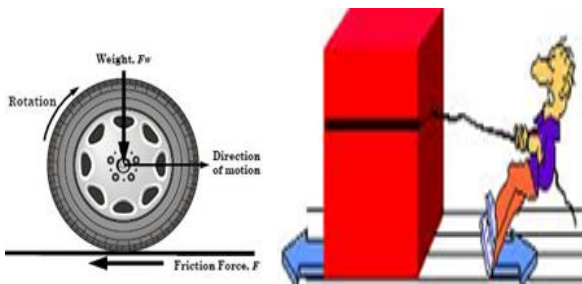
MSET – FRICTION

Purpose

Determine the coefficients of static and dynamic friction of different materials sets.

Friction

Friction is a result of materials in contact with each other and subjected to a bonding force. The adhesion of car tires to pavement is considered a benefit of friction while trying to slide a box across a floor is considered otherwise.



Theory

The coefficient of static friction μ_s is used to quantify the force F_s needed to slide two surfaces relative to each other when connected by a normal force N and is expressed as:

$$\mu_s = F_s / N$$

Once movement occurs the dynamic coefficient of friction μ_k replaces the static coefficient and the force F_k needed to maintain motion is calculated as:

$$F_k = \mu_k N$$

Setup



Results

The measured normal force and angled height that causes sliding will be used to calculate the coefficient of static friction. The dynamic coefficient will be determined by measuring the force after motion begins. Values obtained will be compared to those published. Coefficients will be used to predict forces required to move masses of varying magnitudes and composition

Approximate Coefficients of Friction

	Kinetic	Static
Rubber on concrete (dry)	0.68	0.90
Rubber on concrete (wet)	0.58	
Rubber on asphalt (dry)	0.67	0.85
Rubber on asphalt (wet)	0.53	
Rubber on ice	0.15	
Waxed ski on snow	0.05	0.14
Wood on wood	0.30	0.42
Steel on steel	0.57	0.74
Copper on steel	0.36	0.53
Teflon on Teflon	0.04	