

April 25, 2018

- 1) answers Friction questions
- 2) Friction cont

1. In detail and with physics terminology, what is friction the result of?
 Friction is the result of the two surfaces being pressed together closely, causing intermolecular attractive forces between the molecules of the different surfaces.
2. Does the force of friction have a dependence on surface area? Provide an explanation.
 Yes friction depends on the surface area. The only time friction is independent of surface area is when the mass of the object is evenly distributed.
3. Summarize 3 situations where we will not apply the basic theory of surface friction.
 - The force of friction is independent of the surface area only if the mass of the object is evenly distributed.
 - Certain plastics and rubbers have natural properties that do not fit the standard model of friction i.e. adhesive tape, "ice gripping" tires.
 - The two interacting surfaces must be flat. If spikes or ridges are present the above principals no longer apply.
1. Suppose I have two smooth (to the touch) pieces of iron, how come they do not fuse when I bring them together? Because in reality there will always be small amounts of moisture, air and contaminants on the surfaces, which prevent "ideal" interactions.

Friction is given by the equation:

$$F_f = \mu F_N$$

Where:

F_f = force of friction

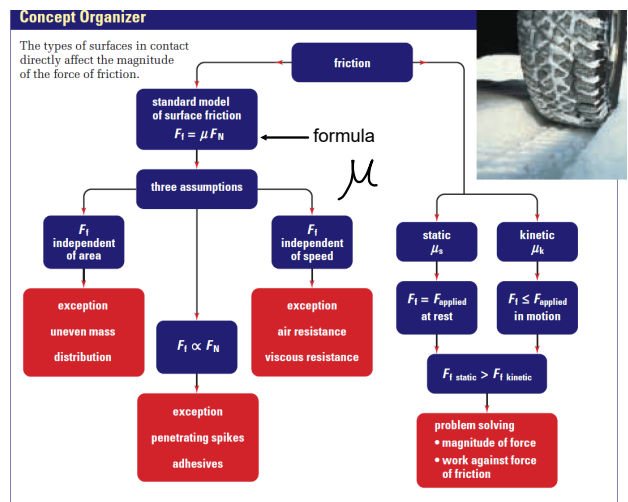
F_N = Normal force (always perpendicular to the surface)

μ = coefficient of friction (no units), depends on both surfaces

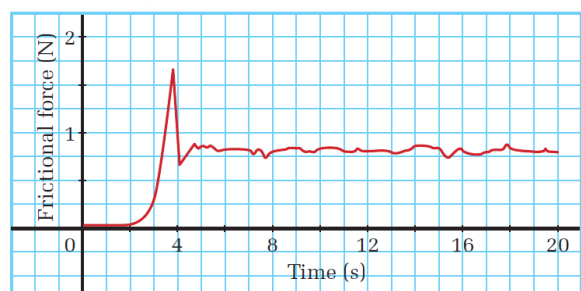
Static Friction : friction on a stationary object

Kinetic Friction : friction on a moving object

Friction_{static} > Friction_{kinetic}



In the above formula F_N is equal to the weight supported by the reference surface.



Forces of Friction Review Questions