



Flipping Physics Lecture Notes: Introduction to Force

Force: Sometimes defined as a push or a pull on an object. I prefer this definition: A force is the ability to cause a change in state of motion of an object. Therefore a force is what has the ability to cause an acceleration and mass is the measurement of how much an object resists that acceleration. Because force is *the ability* to cause a change in state of motion of an object, it doesn't have to cause acceleration.

It is very important to understand that a force is *always* caused by the interaction of two objects:

Example. (Force: two objects)

The dog pulls on the leash. (Tension Force: dog & leash)

The hammer hits the nail. (Force Applied: hammer & nail)

I fall out of a tree toward the Earth (Force of Gravity: me & the Earth)

The car slides to a stop. (The Force of Friction: tires and ground)

Two types of forces are contact and field forces.

Contact forces are the result of two objects touching one another. Examples of contact forces are applied forces, drag force, friction force, force normal, spring force and tension.

Field forces are sometimes called action-at-a-distance forces because they happen even when two interacting objects are *not touching* one another, that's right, there is no physical contact between the two objects. Actually, it would be more accurate to say that they don't have to touch one another. Examples of Field forces are gravitational force, magnetic force and electric force. The gravitational force you are most familiar with, your weight, is an interaction between your body and planet Earth.