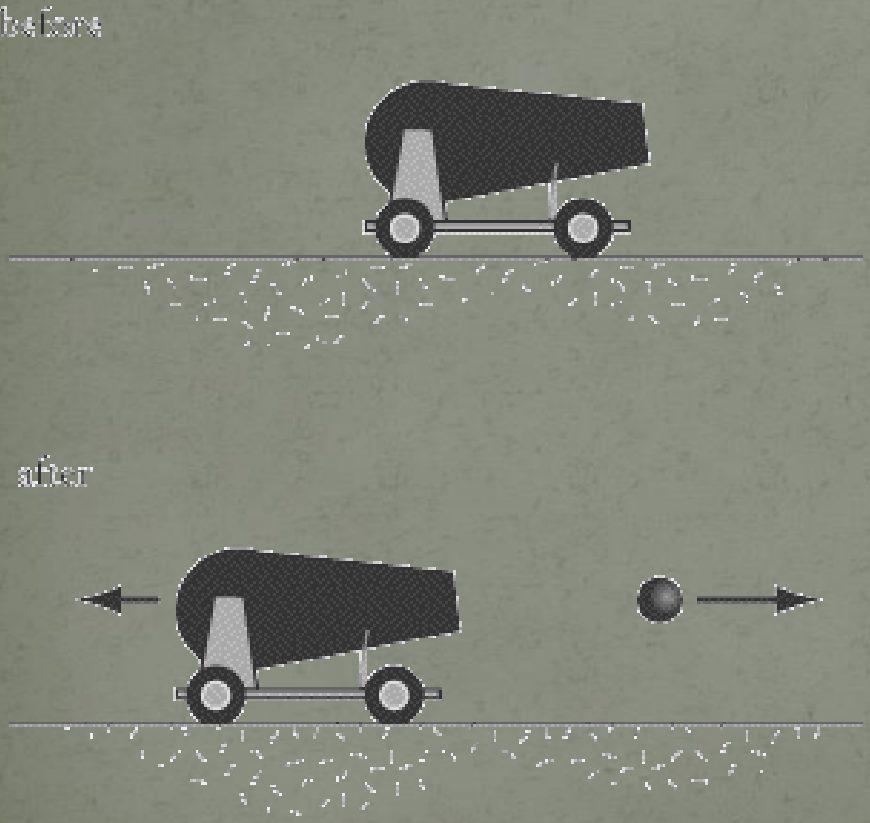
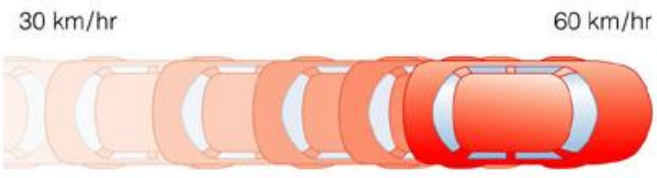
How Do Forces Affect Motion?

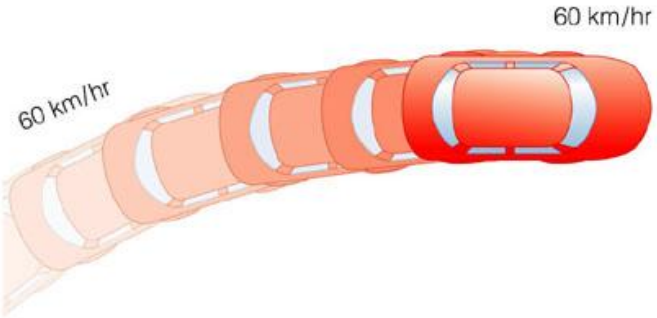
When you tell both the speed and direction of an object, you give its velocity.



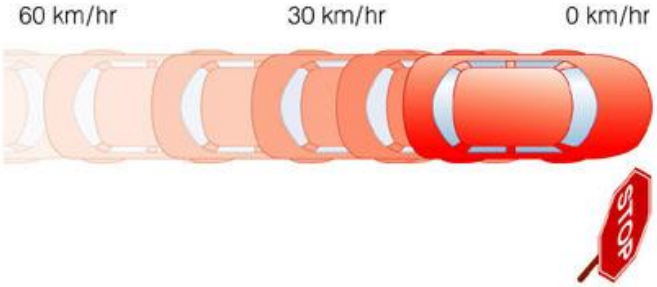
acceleration: any change in the speed or direction of an object's motion.



We say that this car is accelerating because its velocity is increasing.



We say that this car is accelerating because its direction is changing as it turns, which means its velocity is changing even though its speed stays constant.



We say that this car is accelerating because its velocity is decreasing. Decreasing velocity is still acceleration, although it is a negative acceleration.

Describe the ball's changes in velocity.

At what point is the ball accelerating?

force

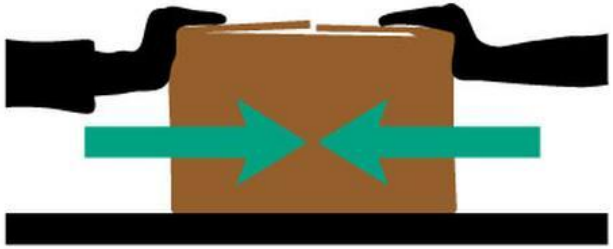
a push or a pull

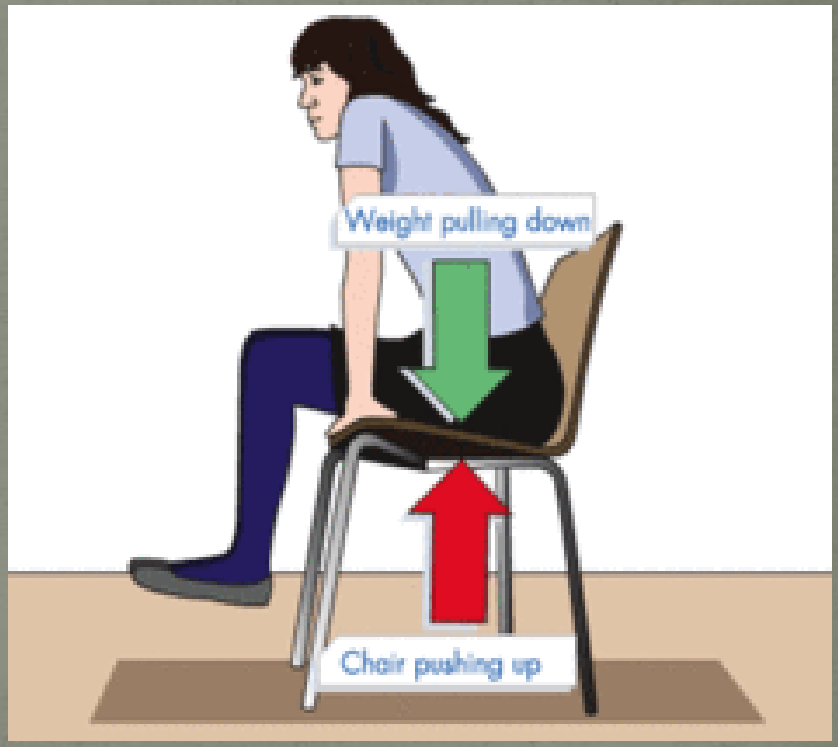
(applied, electric, friction, gravity, magnetic, normal, spring)

More force = more acceleration.

Two forces of the same size but opposite direction will cancel each other out.

Balanced forces = no acceleration





In a game of tug-of-war, would it be fair for there to be more people on one side?

inertia: the property of matter that keeps a moving object moving in a straight line.

A magician quickly pulls the tablecloth from under the dishes. What keeps the dishes in place?

The more mass an object has, the more inertia it has (the harder it is to change its motion).

momentum: describes how hard it is to slow down or stop an object.

Which ball would be harder to stop if they were rolling at the same speed?