

Newton's

1st Law

The Law of Inertia

net force:

The sum of all the forces acting on an object.

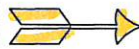


If the net external force on an object is zero, the object's velocity will remain unchanged.

Implications



A non-zero net force will **change** the velocity.



A net force is not required to **maintain** the velocity.



External forces change the motion, not internal forces.

True or False?

If an object is stationary, it must have no external forces acting on it.

TRUE There may be some external forces, but **FALSE** they would be balanced.

If you throw a ball in space the ball will keep going in the same direction at the same speed.

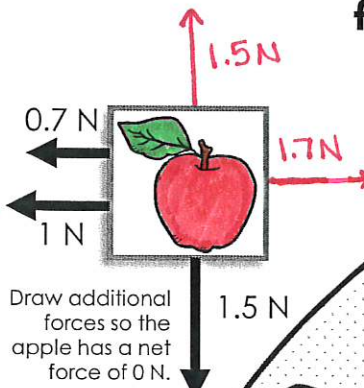
TRUE There is no force **FALSE** to change the velocity.

While sitting in a moving bus you throw an apple up into the air. The apple will land back in your hand.

TRUE The apple continues moving at a constant velocity; **FALSE** not acted upon by a different force.

A bus accelerates forward. If an apple were on the floor of the bus it would move forward.

TRUE The apple would **FALSE** appear to move backward.



Draw additional forces so the apple has a net force of 0 N.

Buckle up!

If you are riding in a car and the speed suddenly decreases...



No seatbelt

You keep moving until another force stops you (airbag, dashboard)



With seatbelt

The seatbelt exerts a force to stop you.