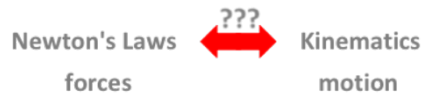


Video Notes for Force and Motion



Two Questions:

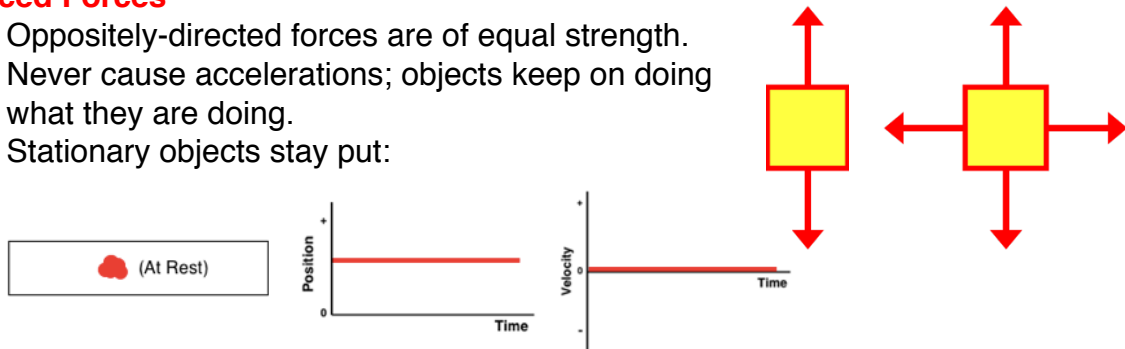
- How do forces affect the motion of an object?
- And how can a force diagram be related to a kinematic representation of an object ... like a dot diagram or a motion graph?

Force Diagrams

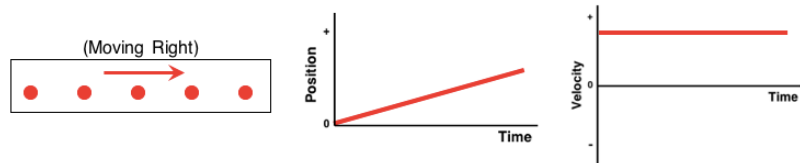
- Forces (pushes and pulls exerted on objects) are represented by arrows.
- Length of arrow is related to strength of force. (Long = Strong)
- Direction of arrow is in direction of force.

Balanced Forces

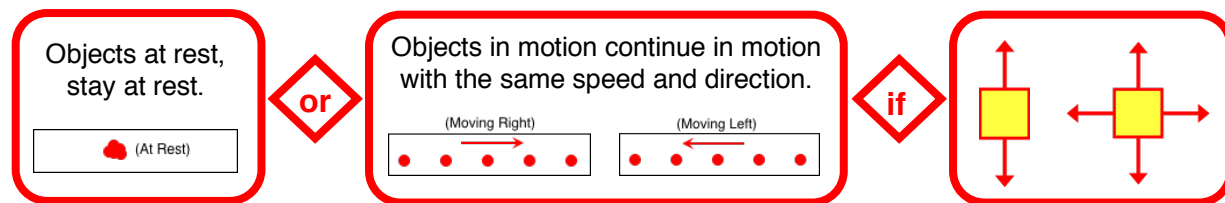
- Oppositely-directed forces are of equal strength.
- Never cause accelerations; objects keep on doing what they are doing.
- Stationary objects stay put:



- Moving objects maintain the same speed and direction:

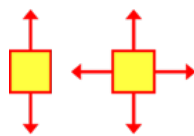


Newton's First Law



You Have to Believe!

Can these objects be moving to the right?

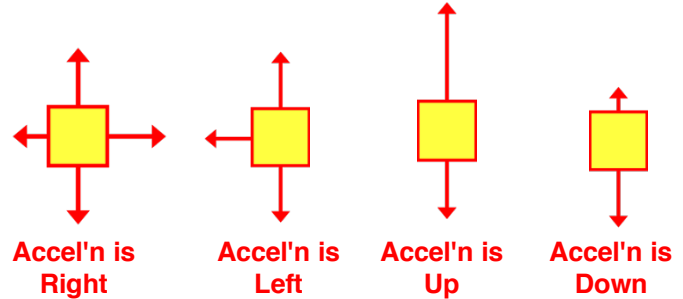


YES!!! You can't tell which direction an object is moving from the forces which act upon it. You can only tell how it is moving -and these objects move with constant speed ... in any direction.

Unbalanced Forces

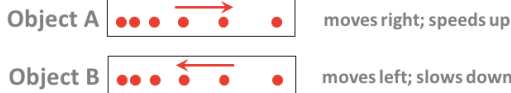
- Oppositely-directed forces are of unequal strength.
- An unbalanced force is also called a **net force**.
- Unbalanced forces cause accelerations.
- The acceleration is in the same direction as the unbalanced force.

A force diagram shows which way an object accelerates: not which way it moves!

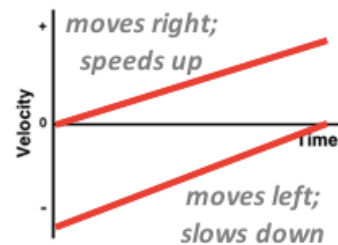
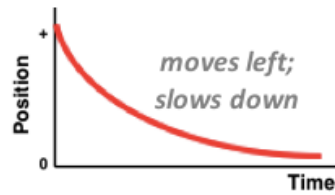
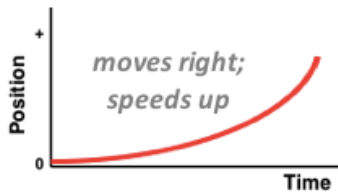
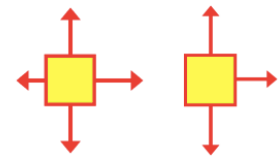


A Rightward Net Force Causes a Rightward Acceleration

Dot Diagrams ... for rightward acceleration:

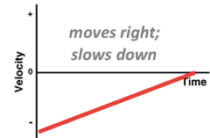
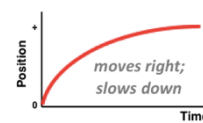
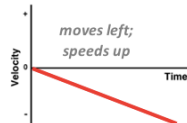
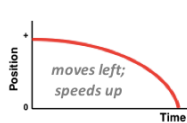
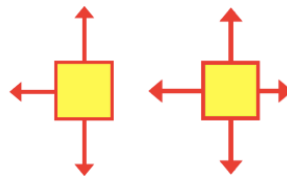


Force Diagrams for rightward acceleration: (more force to right than to left)



A Leftward Net Force Causes a Leftward Acceleration

Force Diagrams for leftward acceleration: (more force to left than to right)



Vertical Motion Follows the Same Principle

These objects would accelerate downward.



This object accelerates upward.

