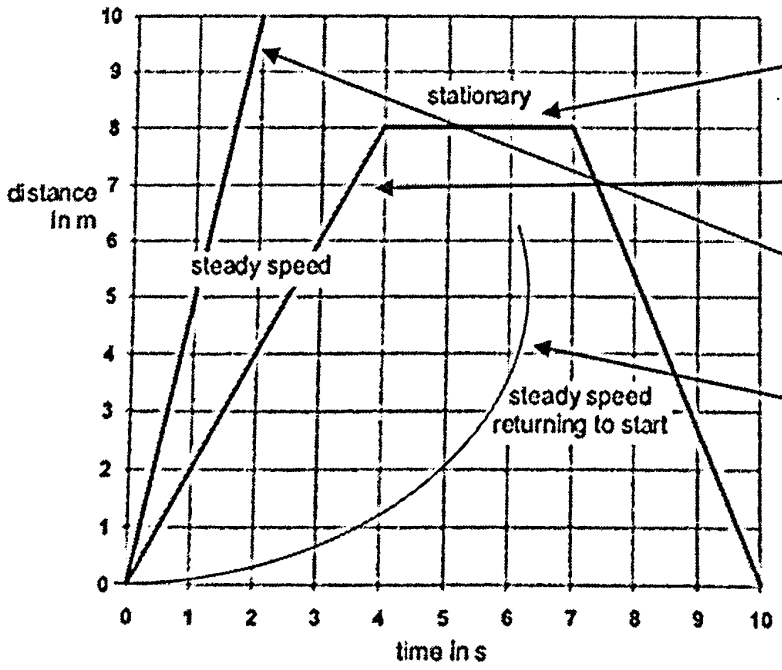
Force and Motion Study Guide

- **Force**-a push or pull exerted on an object
- **Motion**- how an object changes position over time
- **Balanced forces**-when 2 forces are exerting an equal amount of force, so that an object does not show motion. Example: Eli and Jade are both pushing 30 newtons of each side table in opposing directions, so the table does not move.
- **Unbalanced forces**-when one force is exerting more Newtons on an object, than another force, causing an object to move. Example: Kolby pushed the table toward Mrs. Osborne using 50 Newtons of force. Mrs. Osborne pushed back toward Kolby using 35 Newtons of force. The table would move toward Mrs. Osborne.
    - **Unbalanced forces show MOTION, but balanced forces do NOT!**
- **Friction**- the force that one surface exerts on another, when the two surface rub against each other. Friction creates heat! Friction is a force that is created anytime two surfaces move or try to move across each other.
- **Gravity**- the force of attraction between any 2 things that pulls them toward the center of the Earth.
- **Inertia**- This means that objects like to be lazy! ☺ Things that are moving like to keep moving. Things that are not moving do not want to move (This is also known as Newton's 1st Law!)
- **INERTIA is why when you don't have a seatbelt on, you would keep moving forward if the car comes to a sudden stop! Always wear that seatbelt!**
- **Newton's 2nd Law**: The greater a force is, the greater the change (in motion) it produces. The greater the mass of the object being acted on, the less the effect of the (same) force.
- Changing any or all of these factors: (gravity, friction, mass) will affect the motion of an object.
- **Mass**- the amount of "stuff" that something is made off. Gravity does not affect the amount of mass in an object. The more mass something has the harder it is to move and to stop.
- **Weight**- a measure of the force of gravity on an object, how heavy something is. Your weight would be different on the moon than the Earth, but your mass would stay the same.
- **Speed**- the distance that an object moves in a certain amount of time
- **Air resistance**- the force of friction on a vehicle as it moves through the air. Example: New cars are designed with a smooth surface to promote little air resistance.

DISTANCE TIME GRAPHS:



THINGS TO REMEMBER:

- **A flat, horizontal line** means the object is stopped/stationary/not moving
- **A straight, diagonal line** means the object is moving at a steady/constant/same speed
- **THE STEEPER THE DIAGONAL LINE, THE FASTER THE MOTION!**
- **A curved line** shows a gradual change in speed (accelerating: getting faster or slower)

speed = distance ()