

The Nature of Forces

What is a force - Gives energy to an object causing it to move, stop or change directions.

1. A force is a _____
2. Balanced forces (_____) vs. Unbalanced forces (_____)
3. Combining Forces: (draw the examples)

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Friction

1. Friction is a _____
2. Friction will cause an object to _____

Example: _____

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Forces:

- Push or a pull in a particular direction
- When something is dropped it is pulled to the ground by _____
- Forces affect motion
- (_____)
- Forces are measured in newtons _____
- Forces usually act in _____
- Forces usually can not be seen but their effects can
- Forces can cause _____

What is Physics

The study of _____

Motion- occurs when an object changes position over a period of time compared to a reference point.

A. Frame of Reference - _____

*Most common frame of reference is _____

*Can be _____

Measuring Motion

Change in position over time

Distance - _____

Displacement - _____

Example: Three cities lie in a straight line. City A is 12km from City B. City B is 6km from City C. Suppose a delivery drive begins in city A and Travels to city C. Then she travels to city B.

Distance - _____

Displacement - _____

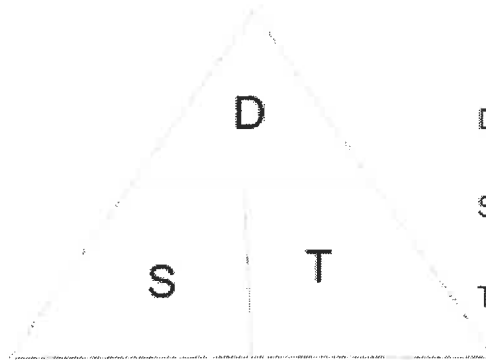
Speed

The distance traveled by a moving object per unit time.

The formula for average speed is _____

Two types of speed

1. _____
2. _____



Formulas

$$\text{Distance} = S \times T$$

$$\text{Speed} = D / T$$

$$\text{Time} = D / S$$

Velocity

Speed of an object in a particular direction

- Velocity changes as _____
- Combining velocities
- Speed is _____

A. _____

B. _____

Acceleration

When the rate of velocity changes you have acceleration

Formula:

When velocity _____ you have positive acceleration

When velocity _____ you have negative acceleration

Momentum

All moving objects have momentum which depends on the mass of the object and the velocity with which it is traveling

- The more momentum an object has, _____
- The formula for momentum is _____
- Conservation of momentum can be transferred. The total momentum of any group of objects remains the same unless acted on by an outside force (gravity, friction)

Gravity and Motion

Acceleration and Falling objects:

- Objects that fall are _____
- All objects fall toward the Earth at the same rate. The rate is 9.8 m/s which means that for every second an object falls its downward velocity increases by 9.8 m/s/s
- _____
- The amount of air resistance depends on _____ of the object

Example _____

Newton's Law of Universal Gravitation

- Gravity is _____
- Force is small between small objects and large between large
- The greater the distance between objects the _____

Newton's Laws of Motion (Law of Inertia)

1st

Example: _____

2nd

Bigger things are harder to push than smaller things

- _____
- _____

Example: _____

3rd

Example: _____

Law of Conservation of Energy

Example: A television converts _____ that can be seen and heard. Not all energy is being converted. Some energy is lost as heat energy.

Potential vs. Kinetic Energy

Have you ever watched a ball bounce? You probably noticed that the ball bounces lower and lower after each bounce. A bouncing ball undergoes a number of energy changes.

Two types of Energy:

1. _____
2. _____

As soon as the ball drops potential energy is converted to kinetic energy. More and more potential energy will be converted. As the ball rises it has potential energy but never as much as when it started.

Forms of Energy

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Heat

Form of energy caused by internal movement of molecules

Heat Transfer - _____

Substances expand while _____ and _____ when cooled

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