Motion PPT NOTES NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Describing Motion

* **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** and **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** are important in describing motion
* a **\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** is needed to determine the position of an object
* motion occurs when an object changes its \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ relative to its reference point

**Distance**

* + describes how far an object has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
  + The SI unit of length or distance is the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (m).
  + longer distances (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – km)
  + shorter distances (\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ – cm)

**displacement** is the distance and direction of an object's change in position from the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_point

Distance vs. Displacement

* In relation to your reference point (starting point):
* Displacement: Where you are
* Distance: How far you have traveled
* Where you are vs. How far you have traveled

Speed

* **Speed** is the distance an object travels \_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Constant Speed

* If you are traveling at a constant speed, you can measure your speed over any distance interval.
* Usually speed is\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ constant.

Average Speed

* Average speed describes speed of motion when speed is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* **Average speed**
  + the total \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ traveled divided by the total \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of travel

Instantaneous Speed

* A \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_shows how fast a car is going at one point in time or at one \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
  + this is instantaneous speed
* **Instantaneous speed**
  + the speed at a given point in time
* when something is speeding up or slowing down, its instantaneous speed is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* if an object is moving with \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_speed, the instantaneous speed doesn't change

Distance vs. Time

* The motion of an object over a period of time can be shown on a distance-time \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* On a distance-time graph, the distance is plotted on the vertical axis and the time on the horizontal axis.

Velocity

* speed describes only how fast something is moving
* to determine \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_you need to know the velocity
* **Velocity**
  + includes the speed of an object and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of its motion
* velocity can \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ even if the speed doesn’t
* V = change in distance

change in time

V = (m/s)

**Acceleration**

* + the rate of change of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* When the velocity of an object changes, the object is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* change in velocity 🡪 change in speed or direction
* Acceleration occurs when an object changes its speed, its direction, or both.
* Objects that \_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_experience acceleration.
* Acceleration also has direction, just as velocity does.

Speeding Up and Slowing Down

* If the acceleration is in the same direction as the velocity, the speed \_\_\_\_\_\_\_\_\_\_\_ and the acceleration is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.
* If the speed \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, the acceleration is in the opposite direction from the velocity, and the acceleration is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Changing Direction

* change in velocity
  + change in speed
  + change in direction
* any time a moving object changes direction, its velocity changes and it is accelerating

Calculating Acceleration

* Change in velocity
  + - * + V = Vf- Vi
* Equation
  + - * + a = Vf- Vi
        + t

Units

* a = acceleration m/s/s or m/s2
* v= velocity
* t = time
* change in velocity is the same as the change in speed when direction of motion is constant moving in a straight line

Positive and Negative Acceleration

* Positive Acceleration = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_
* Negative Acceleration = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_
* **(also known as deceleration)**

Motion and Forces

* **force**
  + is a \_\_\_\_\_\_\_\_\_\_or \_\_\_\_\_\_\_\_\_\_\_\_.
* some forces are not as noticeable as others

Changing Motion

* a force can cause the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ of an object to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Balanced Forces

* force does not always change velocity
* when two or more forces act on an object at the same time, the forces combine to form the **\_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_\_\_\_\_**

Unbalanced Forces

* Forces are unbalanced when there are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ forces in \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ directions, a net force occurs in the direction of the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_force.
* They are considered to be unbalanced forces.
* Forces are combined, or added together, if they are exerted on an object in the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_direction.