Motion Notes Outline McGraw Hill Ch2 Sec1

 \*class discussion accompanies these for full understanding

* Reference points that are fixed can be used to measure things about objects that move.
* Motion – a change in an object’s position relative to a reference point
* Position – where an object is in space; “a unique address”
* Frame of reference – an agreed upon or defined (usually by the experimenter) coordinate system for measuring characteristics of a system

Conventional directions:

Up /Right are positive (+)

Down / Left are negative (-)

 

This is a “side view”.

In many frames of reference, the ground serves as the x-axis.

In contrast to the side view, is the “bird’s eye view”, where you are looking at rooftops.



When thinking about frames of reference, keep in mind that both axes of the graph are position. This is ***unlike*** many of the graphs that we make for labs, with the x-axis as time.

In physics, we have two general categories for quantities.

Scalar Vector

 Magnitude only magnitude and direction

 13 m 13 m north

 Distance displacement

 Speed Velocity

These can the same but are not always the same.

Distance vs. Displacement

How far an object is from its starting position; direction matters, and “backtracking” reduces displacement

Cumulative amount of space traversed; direction has no bearing

Displacements in the same direction or in exactly opposite directions can be added or subtracted. Displacement at right angles to each other require some geometry (called vector addition). We will not be doing vector math this year. But you should be able to describe right-angle displacements like this:

 3 m east, 2 m south, 3 m east, and 5 m north

 Total distance: \_\_13 m\_\_\_\_

 Displacement: \_\_6 m east and 3 m north\_\_\_

 The dashed line is the displacement. The solid line is the actual path.

Speed

The rate in which an object changes its position. Direction does not matter.

$s=\frac{d}{t}$ $speed= \frac{distance}{time}$

\*\*Units for speed are usually m/s, but can be any unit of distance divided by any unit of time.

\*\*When you are solving problems, you should be able to recognize a value for speed by the units.