DESCRIBING MOTION

Science: we develop an understanding of the world by basing our conclusions ONLY upon evidence and observation.

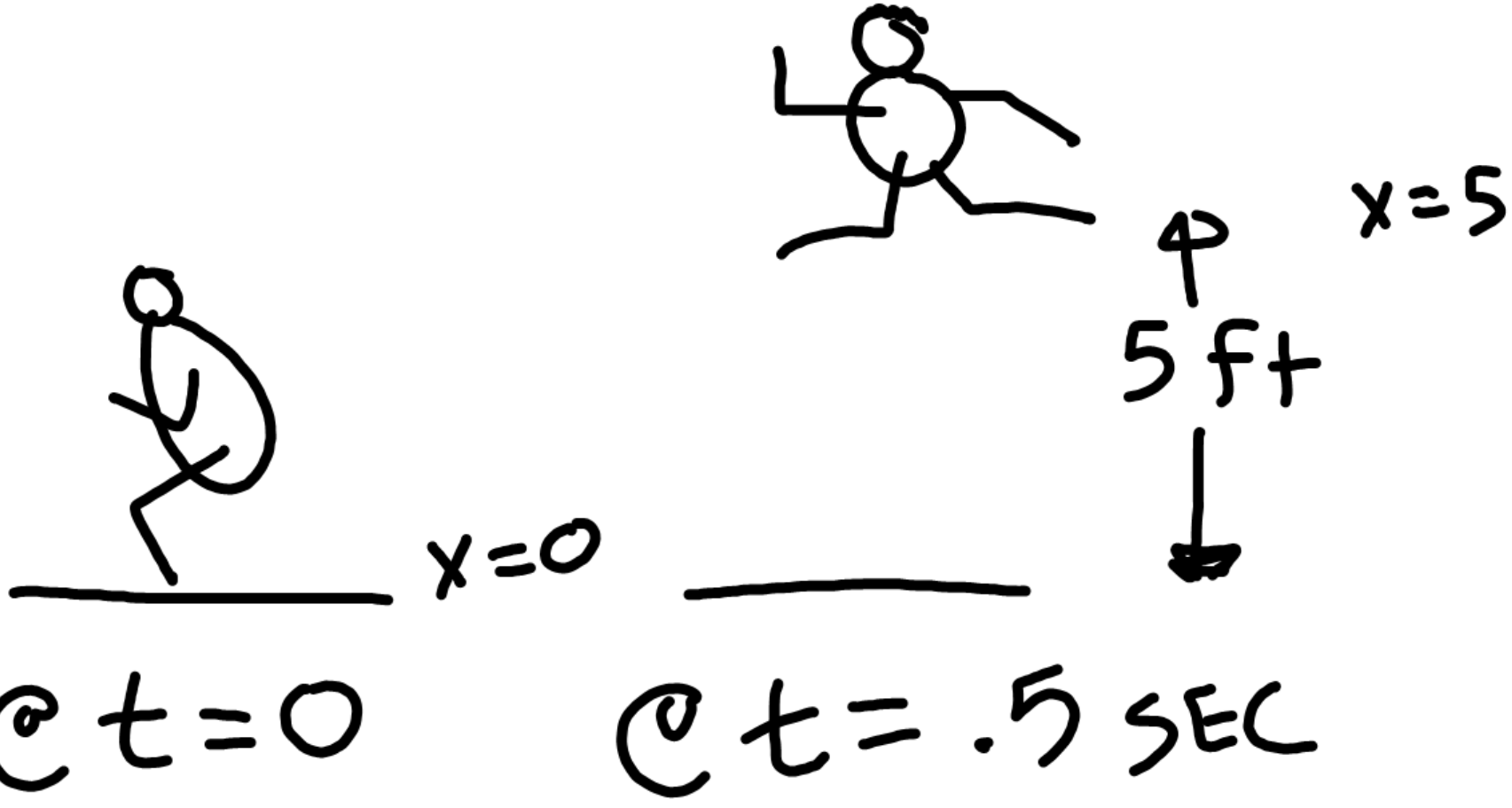
Because of this, we want to be careful when describing things.

When describing an object's motion, there are terms that must be used that have specific meanings.

Reference frame: what is used to define an object's motion.

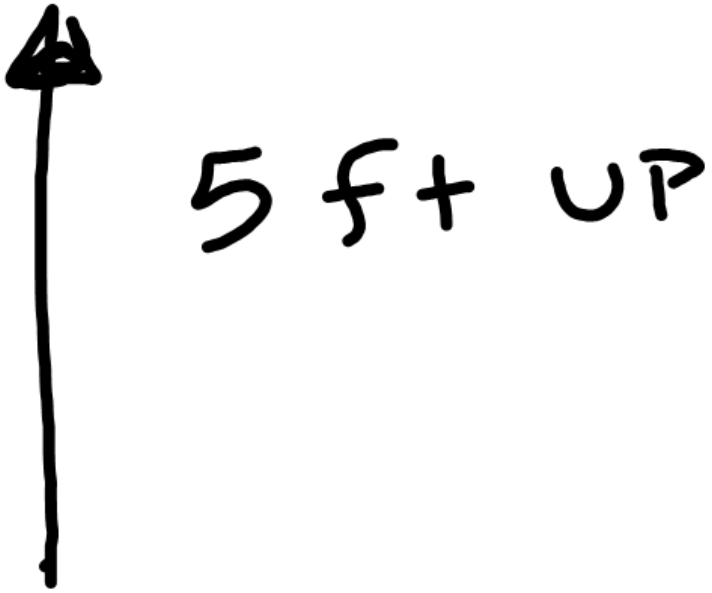
When I walk across the room, the room serves as our reference frame.

Position: an object's location with respect to some reference frame at some moment in time.



Displacement: an object's location relative to its starting point.

Displacement always has a magnitude (a distance) and a direction. YOU CAN'T HAVE ONE WITHOUT THE OTHER!



Distance travelled: the total distance an object moves regardless of where it starts. Direction does not matter.

KOBE'S DISTANCE TRAVELLED IS 10 ft.

Speed: the rate at which an object's position changes with time.

$$\text{SPEED} = \frac{\text{DISTANCE TRAVELLED}}{\text{TIME IT TAKES}}$$

VELOCITY: the rate at which an object's displacement changes with time.

$$\text{Velocity} = \frac{\text{Displacement}}{\text{Time}}$$

You Have To Specify Direction!

When an object accelerates, its velocity is changing with time. It is:

a) Speeding up (velocity increasing)
b) Slowing down (velocity decreasing)

$$\text{Acceleration} = \frac{\text{Change In Velocity}}{\text{Time}}$$