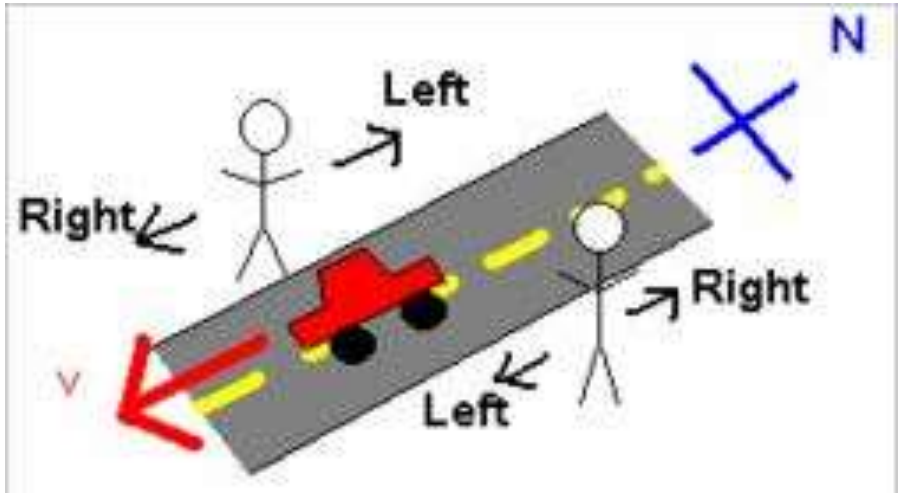
Motion

How things move

Frame of Reference

- In order to know that something is moving, and to know how it is moving we need a frame of reference.

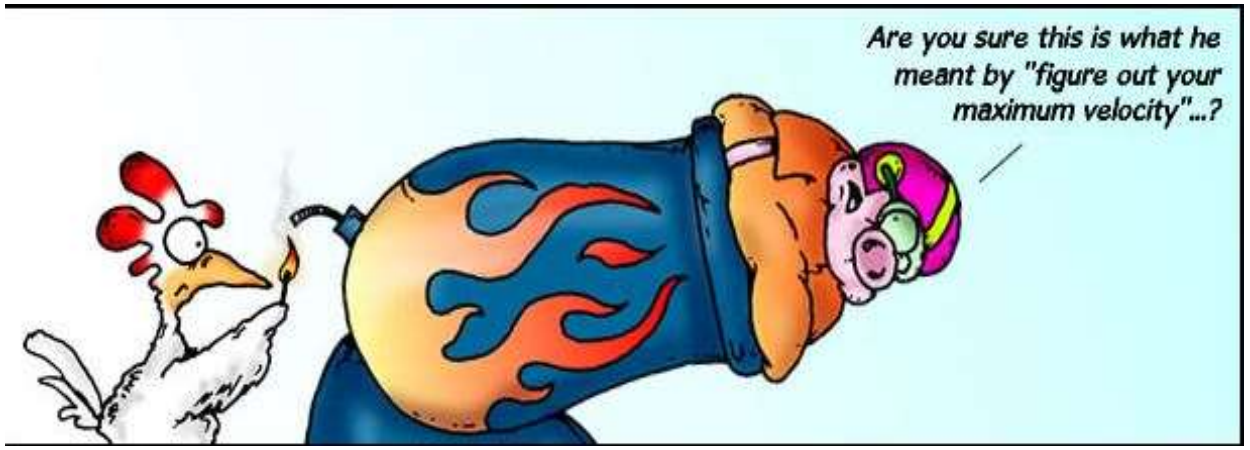


Distance vs Displacement

Motion: the displacement of an object in relation to objects that are considered to be stationary.

Distance: The total length traveled in a given time frame; scalar quantity

Displacement: that change of position in a particular direction from a specific starting point. Vector quantity (Units: m, km)



Speed vs Velocity

Speed: the time rate of motion. How fast something is moving; scalar quantity.

Average Speed: found by dividing the TOTAL distance by the lapsed time.

Velocity: speed in a particular **direction**; vector quantity. (Units: $\frac{m}{s}$)

Constant Velocity: $v = \frac{d}{t}$

Acceleration

Acceleration: the time rate of change of velocity; vector quantity. (Units: $\frac{m}{s^2}$)

Deceleration: occurs in the opposite direction of acceleration. The direction of acceleration is described as either positive or negative.

(Positive = acceleration; Negative = deceleration)