I can describe how objects move using terminology from class. ***325-7***

Motion

Motion is all around us. You are actually moving even while sitting!

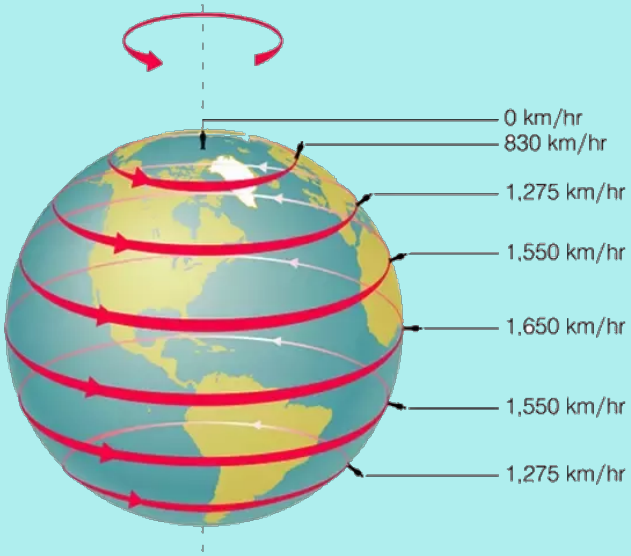
Let's think about it....

Circumference of the Earth (equator) - 40 075 km.

Time it takes the Earth to rotate - 24 hours.

What would the speed be??

But that would be just at the equator...



Some terminology we need to know:

kinematics: the study of motion

uniform motion: movement at a constant speed in a straight line

nonuniform motion: movement that involves change in speed or direction or both

scalar quantity: a quantity that has a magnitude, but no direction

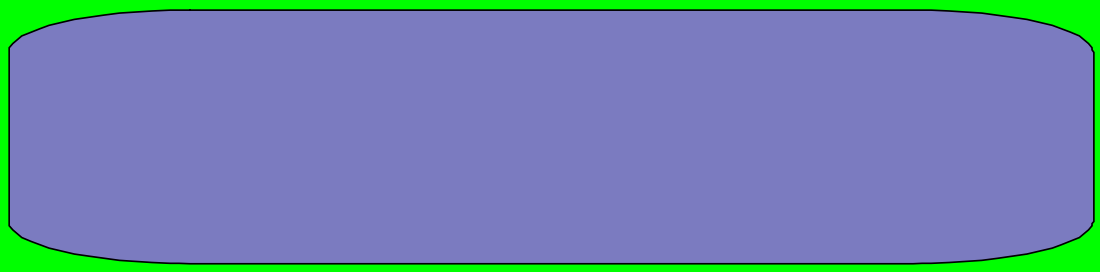
Which motion do you think we experience more often? Uniform or nonuniform motion?

The speed we see in our day-to-day lives are usually given in km/h or m/s

Because speed involves both distance and time, the three of them are examples of a scalar quantity.

There is also a relationship we can use to convert between m/s and km/h

$1 \frac{\text{meter}}{\text{second}} \times$



Average Speed vs Instantaneous Speed

Using the 2012 Olympics as an example :

Average speed is calculated as

$$V_{av} = \frac{d}{t}$$

speed; average; distance; time

Example:

The Hennessey Venom F5 can get from Centreville to Fredericton (a distance of 135 km) in 0.2786 hours.

a) How fast can the car go?

b) What would be the answer in m/s?

c) How many minutes would it take?

Important!

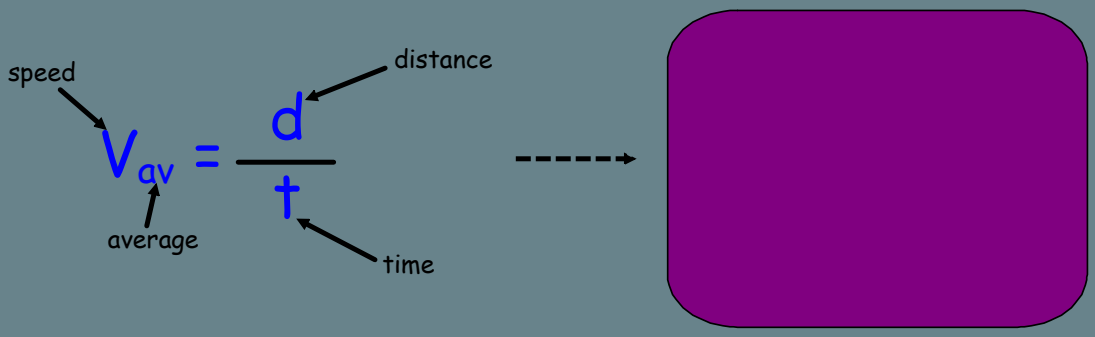
This equation does not work for objects in free fall.

$$V_{av} = \frac{d}{t}$$

velocity — average — distance — time

Why?

What if we needed to find distance or time?



Try these:

Take the time to show your work, it will come in handy later

a) d = 45km, t = 2.0hours, v = ?
b) d = 101m, v = 30.0m/s, t = ?
c) v = 20.0 m/s, t = 60.0 seconds, d = ?
d) v = 120km/h, d = 8.0km t = ? (answer in seconds)
e) t = 1 minute, v = 15m/s, d = ?
f) d = 10000.0 meters, t = 2.0 hours, v = ?

Example 2:

The world record for the fastest backwards runner covered 1 mile (1.60934 km) in 5 minutes 54.25 seconds on November 23rd, 2015. How fast was his average speed?

Hint: Convert all variables to the same unit

Problems Using Average Speed