

## Section 4-1

# Motion



# Motion

Watch the ball slowly roll across the table.

Work with a partner to decide what you would measure to determine the ball's speed.



## What is motion?

An object is in motion when its distance from another object is changing.

## What is a reference point?

A place or object used for comparison to determine if something is in motion.



$$\textit{Speed} = \frac{\textit{Distance}}{\textit{Time}}$$

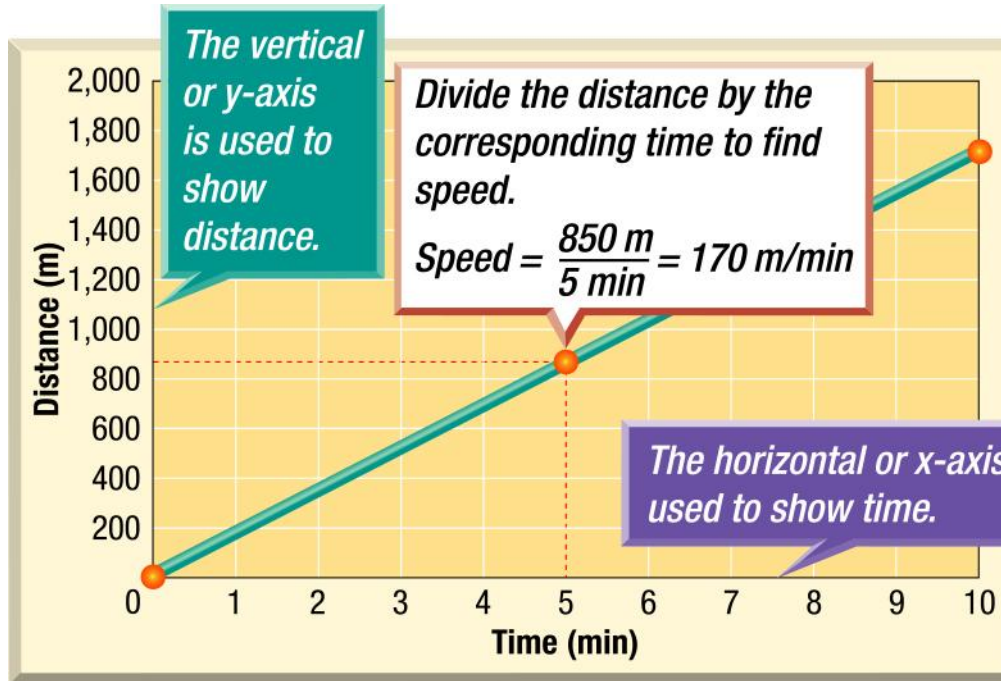


## Velocity:

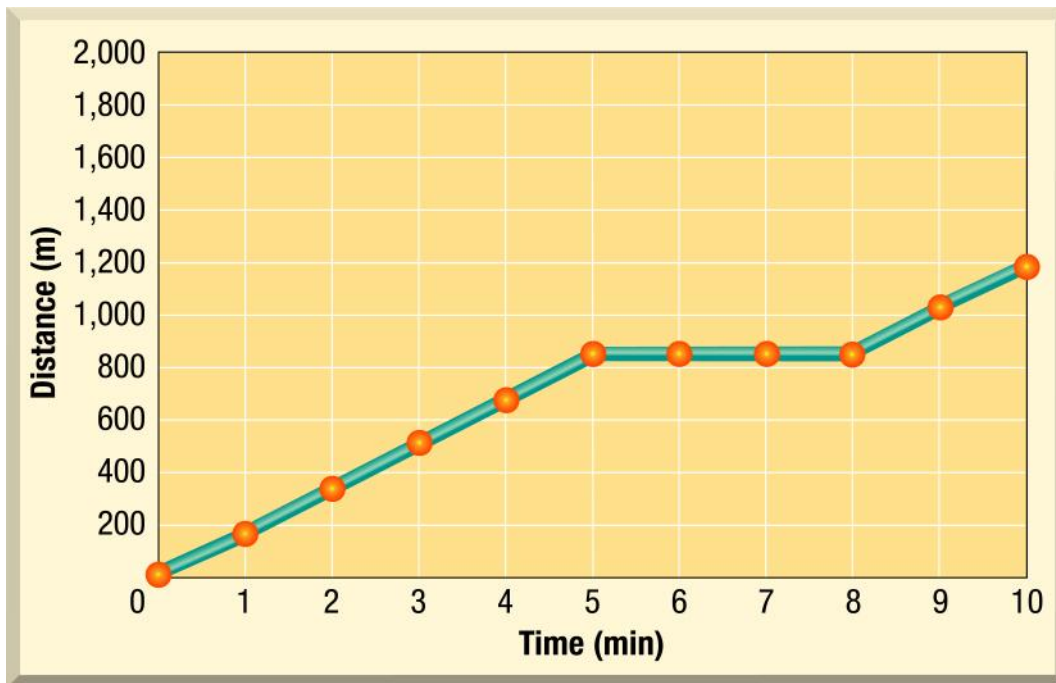
When you know both the *speed and direction* of an objects motion, you know the *velocity* of the object.



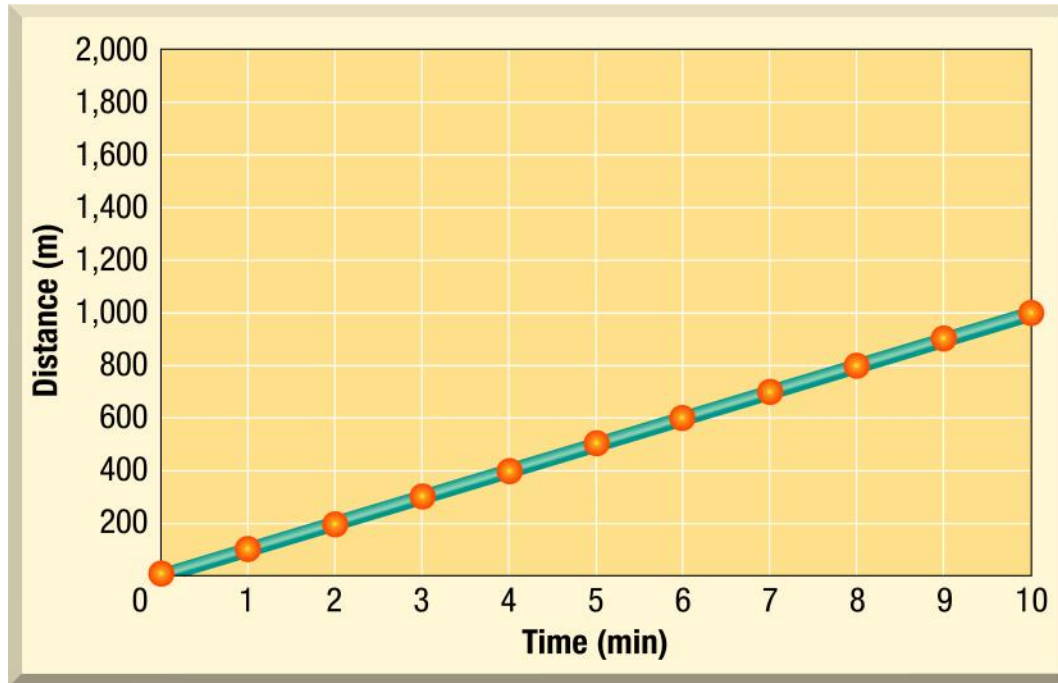
**First Day**  
Start with  
enthusiasm

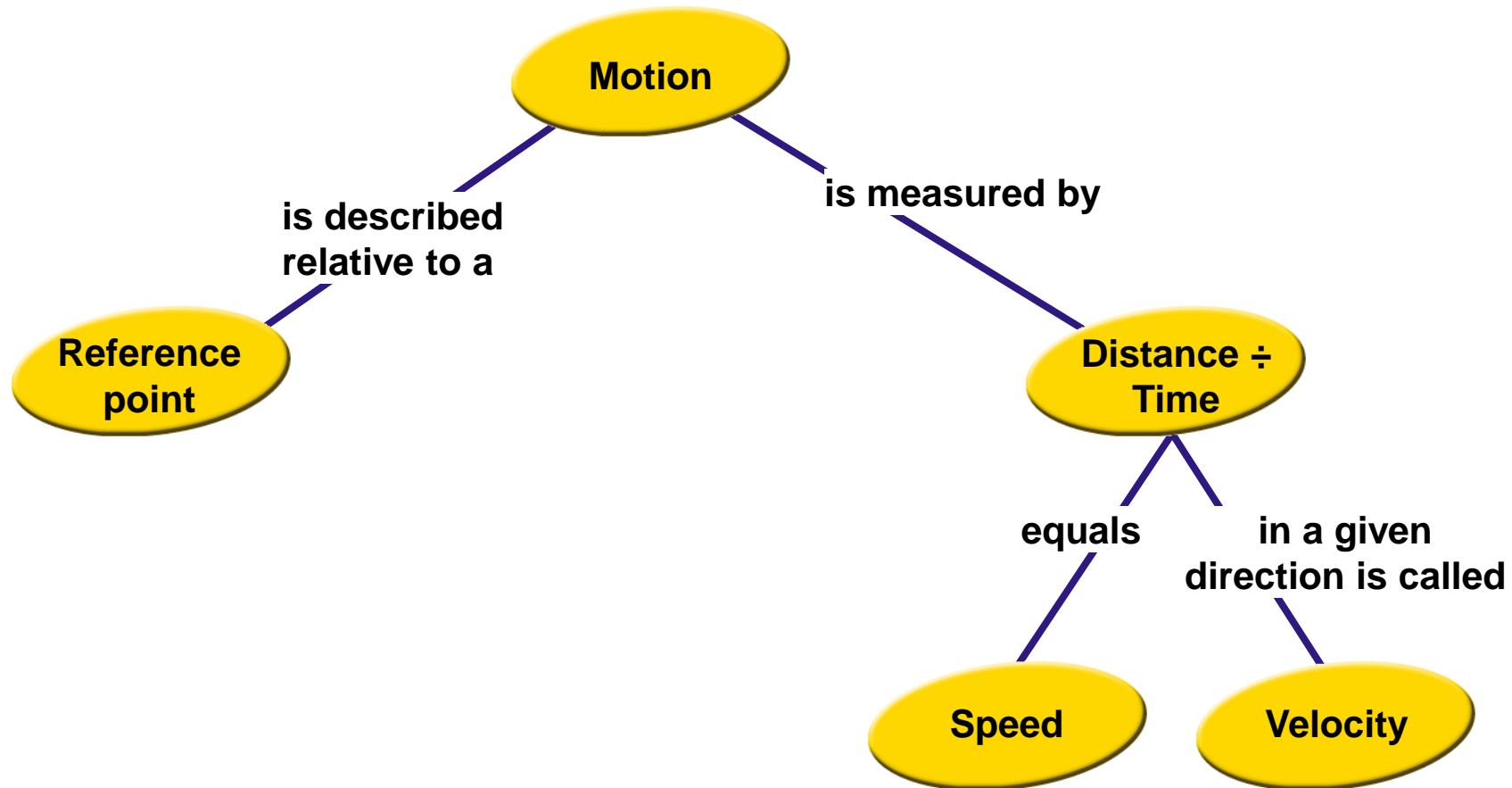


**Second Day**  
Take a break



**Third Day**  
Slow Down





## **Section 4-2**

# **Slow Motion on Planet Earth**



## Plate Tectonics:

Earth's plates move ever so slowly in various directions.

How fast?

A few millimeters per year to a few centimeters per year



**Using Distance = Speed x Time**

**5 cm/yr for 1000 years: The plate moves  
50 meters**

**What is wrong with this theory?**



## Section 4-3

# Acceleration



**Look at the balloon.**

**Describe the motion of the balloon.**

**What could you do to make the balloon move?**

**Describe when the balloon changed speed or direction.**



## What is acceleration?

The rate at which velocity changes.

Acceleration refers to **increasing speed, decreasing speed, or changing direction.**

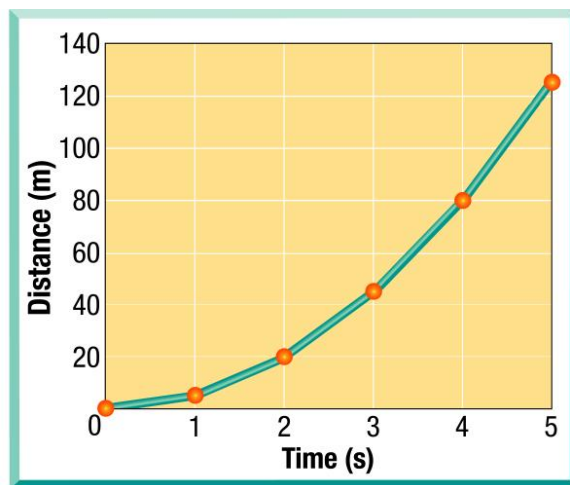
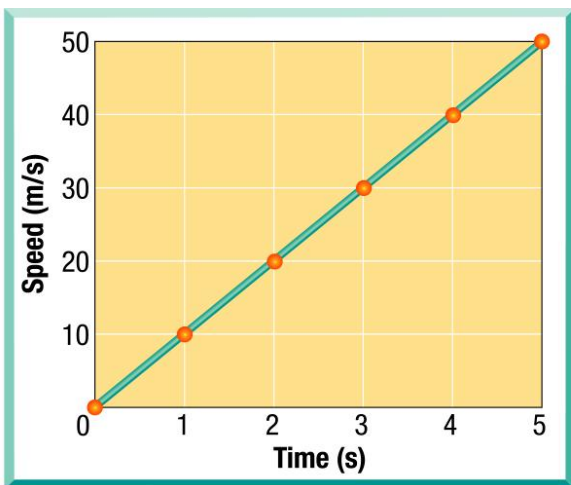


## How do you calculate acceleration?

$$\textit{Acceleration} = \frac{\textit{Final velocity} - \textit{Initial velocity}}{\textit{Time}}$$

Imagine you riding in a car traveling at 30 km/h. Exactly 1 minute later, the speedometer reads 50 km/h. What is your acceleration?





Time (s)	Speed (m/s)	Distance(m)
0	0	0
1	10	5
2	20	20
3	30	45
4	40	80
5	50	125

Changes in Speed and Distance Over Time

