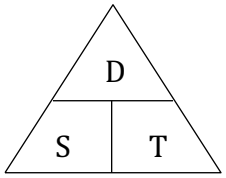
Velocity and Acceleration Cloze Notes

S8P3. Students will investigate relationship between force, mass, and the motion of objects.
a. Determine the relationship between velocity and acceleration.

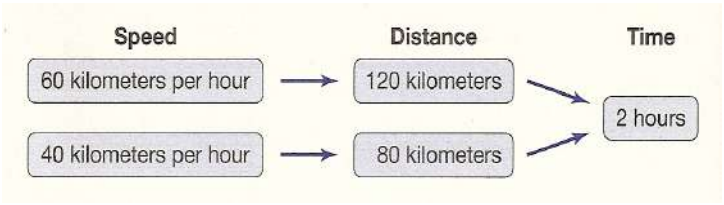
Speed

- A _____ is a push or a pull
- When a force acts on an object, one possible result is _____.
- A _____ _____ is generally a stationary object such as a tree, a street sign, or a line on the road.
- Once a reference point has been established, it is possible to define the _____ of an _____ in terms of _____, _____, and _____.
- The _____ of an object refers to how fast an object moves.
    - To determine speed you need to know both the _____ an object _____ and the amount of _____ needed to _____.
- Calculations using formulas:
    - Most objects do not move at a constant, unchanging speed.
    - When you use the formula to find the speed of an object you're actually finding the object's _____ _____.

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



- The diagram shows how two automobiles with different speeds move during the same amount of time.



- Speed can be shown on a graph of _____ vs _____.
- Notice that the line of this graph is not straight. This is because the object's speed _____.

Velocity

- _____ is the speed of an object in a _____ _____.
- Suppose that two cars traveled at 50 kilometers per hour on the same highway for 2 hours. After two hours, the cars are 200 kilometers away from each other.
    - *How is this possible?* They were traveling in opposite directions.

- _____ describes _____ and _____, but does NOT indicate _____.
- When the _____ of an object's _____ is included, you are describing an object's _____.
- Velocity _____ when the _____ or the _____ of an object changes.
    - If a sailboat's speed goes from 4 knots to 7 knots, its _____ has changed. If the sailboat continues moving at 7 knots, but changes _____, its velocity has again changed.

Acceleration

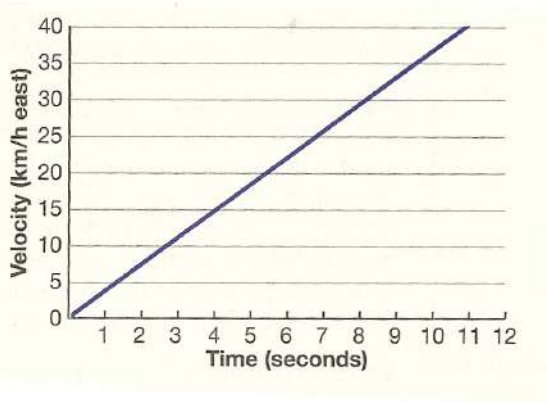
- _____ is the rate at which an object's velocity changes.
    - _____ changes when an object's speed and direction changes.
    - _____ of an object also changes if its speed or its direction changes.
- You can calculate the _____ _____ of an object by using the following equation.

$$\text{Average Acceleration} = \frac{\text{final velocity minus starting velocity}}{\text{time}}$$

- _____ is recorded in units such as meters per second squared (m/s^2).
- Acceleration of a Car Example:
    - Based on this data, you can see that the acceleration of the car at any time is 5m/s/s or 5 m/s^2. Every second, the velocity of the car increases by 5 m/s.

Time (seconds)	Velocity (meters per second east)
0	0
1	5
2	10
3	15
4	20

- Assume that the following graph plots your acceleration (velocity vs. time) during a car trip. The graph shows that at 10 seconds, the velocity of the car was 35 kilometers per hour east.



- These equations can be used to calculate the average acceleration of the car.

$$\text{acceleration} = \frac{35\ \text{km/h east} - 0\ \text{km/h east}}{10\text{s}}$$

$$= \frac{35\ \text{km/h}}{10\text{s}} = 3.5\ \text{km/h/s east}$$