Name_____Science Teacher_____Period_____Date_____

# Motion and Forces Learning Targets
## Chapter 5, Sections 1 - 3

| Target | Before we start | With Help | On My Own | Teach It |
|---|---|---|---|---|
| 1. I can calculate speed using the correct formula and give the correct answer with correct units. | | | | |
| 2. I can calculate velocity using the correct formula and give the correct answer with correct units and direction. | | | | |
| 3. I can place distance and time on the correct axes on a line graph, calculate the interval, and correctly plot time and distance. | | | | |
| 4. I can interpret and analyze a graph to be able to calculate speed at any given point or average speed. | | | | |
| 5. I can identify what constant speed, stopping, slowing down, and speeding up look like on a graph. | | | | |
| 6. I know the difference between a contact force and a noncontact force and can give examples of each. | | | | |
| 7. I know the difference between a balanced force and an unbalanced force and can give examples of each. | | | | |
| 8. I can calculate Net Force when given a set of balanced or unbalanced forces. | | | | |
| 9. I can demonstrate and explain how inclined planes can be used to change the amount of force to move an object. | | | | |

**Make and study flashcards for these vocabulary terms. If terms don't have page numbers, then they are highlighted in your text.**

Reference point – **the starting point you choose to describe the location, or position, of an object**

Motion – **the process of changing position**

Speed – **the distance an object moves in a unit of time**

Average Speed – **The total distance traveled divided by the total time**

Velocity – **the speed AND direction of a moving object**

Distance/Time Graph – **a graph that shows how distance and time are related**

Force – **a push or a pull on an object**

Contact Force – **a push or a pull one object applies to another object that is touching it**

Noncontact Force – **a force that one object applies to another object without touching it**

Gravity – **an attractive force that exists between all objects that have mass**

Mass – **the amount of matter in an object**

Weight – **the measure of the gravitational force acting on an object's mass**

Friction – **a contact force that resists the sliding motion of two surfaces that are touching**

Air Resistance – **the frictional force between air and objects moving through it**

Net Force – **When more than one force acts on an object, the forces combine and act as one force. The sum of all the forces acting on an object is net force.**

Balanced Force – **If the net force on an object is 0 N**

Unbalanced Force – **if the net force on an object is not 0 N**

Simple Machine – **has only one or two parts and is the simplest form of a device that can make work easier**

Inclined Plane (ramp) – **a flat, sloped surface**

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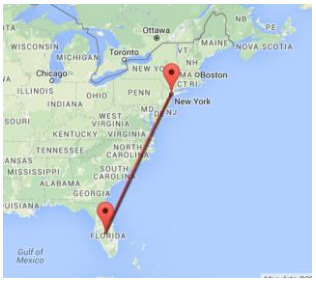
**Targets 1**

What is the formula to calculate speed? **Speed = distance / time** $S = \frac{d}{t}$

A cheetah ran 100 m in 20 seconds. What was its average speed? **100 m / 20 sec = 5 m/sec**

**Target 2**

The family took a vacation and traveled from Florida to New York. They traveled 1000 miles. It took them two days to make the trip. What was the average velocity on their trip?




**Formula - V = speed (d/t) and direction**

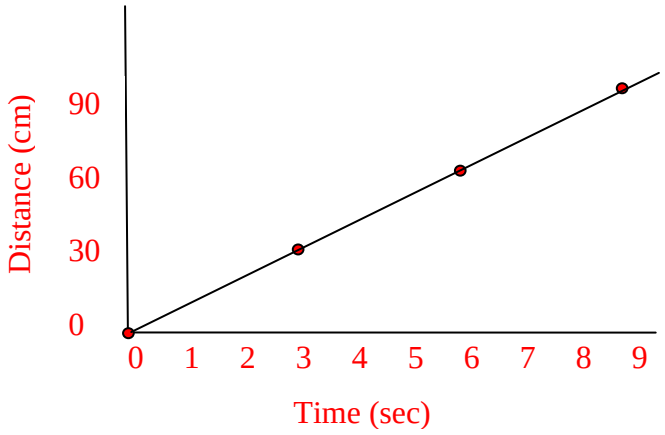
**Equation - V = 1000 miles/2 days and direction =**

**Answer - V = 500 miles/day, Northeast (NE)**

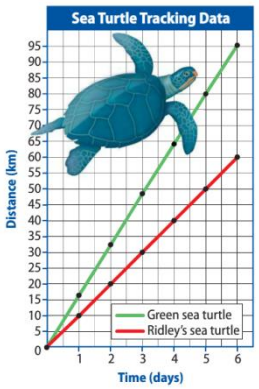
**Target 3**

Plot the turtle's travel.

| Time (sec) | Distance (cm) |
|---|---|
| 0 | 0 |
| 3 | 30 |
| 6 | 60 |
| 9 | 90 |



## Target 4




Which turtle traveled fastest? The green sea turtle traveled the fastest because it went the longest distance in 6 days.

What is the speed of each turtle at 4 days?
Green sea turtle s = d/t = 65 km/4 days = 16.25 km/day
Ridley's sea turtle s = d/t = 40 km/4 days = 10 km/day

What is the average speed of each turtle? Total distance/total time
Green sea turtle 95 km/6 days = 15.83 km/day
Ridley's sea turtle 60 km/6 days = 10 km/day

## Target 5


constant speed | increasing speed | decreasing speed | stopping

## Target 6

Contact Force – a force that one object applies to another object that is touching it
Example: finger pushing a button, box scraping across a floor, ball when it hits a bat

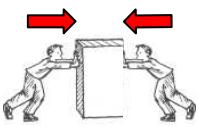
Noncontact Force – a force that one object applies to another object without touching it
Example: static electricity, magnetism, gravity

## Targets 7 and 8

Balanced Force – **If the net force on an object is 0 N. The object doesn't move.**

Unbalanced Force – **When the net force on an object is not 0 N. The object moves**

Is the picture to the left demonstrating a balanced force or an unbalanced force?
Unbalanced force
Calculate the net force.
**-100 N (down) + 200 N (up)= 100 N (up)**

5N  5N

Is the picture to the left demonstrating a balanced force or an unbalanced force?
Balanced force
Calculate the net force.
**5 N (right) + -5 N (left) = 0 N**

**Target 9**

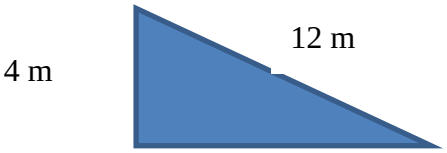
What are three ways a simple machine can make work easier?

1. increasing distance,
2. decreasing force, or
3. changing the direction

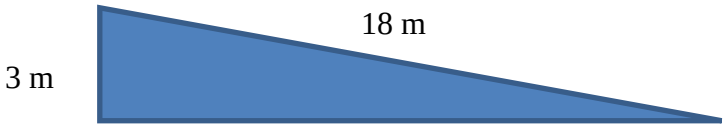
How do you find mechanical advantage of an inclined plane?

$MA = \frac{L}{H}$

Which of these inclined planes has the greater mechanical advantage?
Why? The second inclined plane has the greater mechanical advantage because when you take the length and divide it by the height it is greater than the first one.




$MA = \frac{12m}{4m} = 3$




$MA = \frac{18m}{3m} = 6$