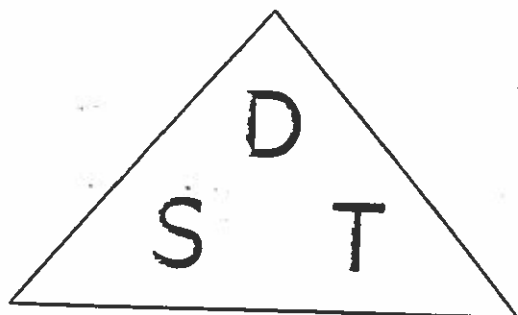# Describing Motion

Purpose: To understand how to calculate speed.

READD ➜➜➜Background: The speed of an object is determined by the amount of time it takes to move a particular distance. Speed can be calculated using the formula below.

Speed = Distance ÷ Time

Using the same formula, you can also calculate Time and Distance.

Time = Distance ÷ Speed

Distance = Speed x Time

Notice that the triangle on the left has D for distance, S for speed and T for time. Now look at the formulas. See if you see the pattern between the formulas and the placement of the letters in the triangle.

Make sure you have today's lab materials:
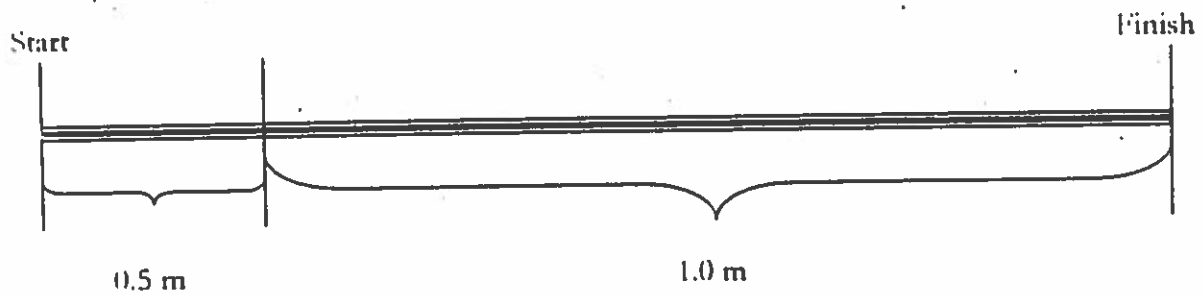
"Race track"
Calculator
Stopwatch
Masking tape (to create start line, time line, and finish line if needed)

Battery operated car
Meter stick

Create your "race track" if necessary - it should look like this:

Start   Finish

0.5 m   1.0 m

1. Start the car at the starting line.
2. The starter should put the toy car at the starting line and start the car.
3. The timer will begin timing the car when the car passes the Time Line. Stop timing when the car crosses the Finish Line.
4. Record the time it took for the car to travel the 1 meter course.
5. Repeat for a total of 5 trials.

Put your data and calculations here:

Trial	Distance (m)	Time (s)	Speed (Distance ÷ Time)
1	1 meter		
2			
3			
4			
5			
Average			

Calculate the speed of your car in each trial by dividing the Distance (which is always 1 meter) by the time it takes to cross the finish line.

Calculate the average speed of the car by averaging the time for each trial and divide the distance (1 meter) by the average time.

Stay in your lab groups and complete the following questions together using complete sentences!

1. Why do you need to repeat your measurements (do more than one trial?)
_____
_____
_____

2. Why did you let the car move for 0.5 m before starting to time?
_____
_____
_____

> Time = Distance ÷ Speed

3. Predict how many seconds it would take your car to move 1.5 m.
_____

Now, test your prediction. Record your actual results.
_____

4. Predict how many seconds it would take your car to move 0.75 m.
_____

Now, test your prediction. Record your actual results.
_____

> Distance = Speed x Time

5. Pick a TIME in seconds for your car to travel _____
   a. Predict the DISTANCE your car will travel in that amount of time: _____
   b. Test your prediction. Describe what you did to test your prediction.
_____
_____
_____

6. Using the information you have learned so far, write a definition of speed in your own words.
_____
_____
_____

Homework:
Practice problems
READ ➡➡➡ Write the formula you will use for each problem first. Show all your work!!! Don't forget your <u>units</u>.

7. The earth travels at about 68,000 miles/hour as it moves around the sun. How many miles does the earth travel in 24 hours?

8. An airplane travels 600 miles in 2 hours. What is the speed of the plane?

9. A toy car rolls down a ramp covering 8 meters in 4 seconds. What is its speed?

10.   A runner goes around the 400 meter track in 48 seconds. What is the runner's speed?

    a. The world record time is 44.57 seconds. Is this a new world record? Why or Why not?

11. You drive 150 miles in 3 hours before stopping for 30 minutes (or 0.5 hours) for lunch and gas. After lunch you travel 100 miles in an 1.5 hours.

    a. What is the total distance you traveled? _____
    b. How much time did your total trip take?_____
    c. What was your average speed?_____