

Physics Lab 1: Zooooooom! How fast is fast?

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Audience: Middle school physical science

Objectives

- Identify how to determine an object's speed
- Determine lab procedure to calculate an object's average speed
- Understand the difference between speed and velocity

Pre-Lab Questions

1. What is a reference point?

An object that appears to stay in place in relation to an object being observed for motion.

2. What two things must you know to determine speed?

Total distance traveled
Total time to travel that distance

3. What is the difference between speed and velocity?

Speed is the rate at which an object moves. Velocity is the speed of an object in a particular direction.

Group Lab

Materials

- Toy car
- Meter stick
- Stopwatch
- Masking Tape

In your **groups of three**, discuss and write down the procedure to determine the average speed of your toy car.

Procedure

Give students 15 minutes in their group to come up with lab procedures. If they are having problems refer them to Pre-lab question number 2.

Class Discussion. As a class we will decide on standard procedures to determine the average speed.

Before giving them the procedure below, have them share their procedures.

Procedure

- 1. Place a piece of masking tape on the floor and label it *reference point*.**
- 2. Place the front of the car at the starting point**
- 3. Group member 1 will count to three. On three, group member 2 will push the car and group member 3 will start timing.**
- 4. At the moment the car stops, group member 3 will stop timing.**
- 5. Mark the final location of the car and measure the distance (in meters) from the starting point.**
- 6. In the table record the distance the car traveled and the time to travel that distance.**
- 7. Calculate speed.**

For Velocity: it's the average speed, with the direction specified. Be sure to show the students which direction is North.

Perform the procedures we determined as a class three times. Record all you data in table below. Be sure to include the units.

Trial Number	Distance	Time	Average Speed	Average Velocity
1				
2				
3				

For each trial, have students note who pushed the car, who timed the car, and who measured the distance. The students should rotate through each position.