

...the Need for Speed!

Introduction

Although you may never have given it much thought to your activity the last time you walked from one place to another you were actually observing some basic physics concepts...you were in motion. Motion is movement from one location to another in a certain amount of time and in a given direction. In this activity you will take measurements of your motion and use those measurements to describe your motion and determine relationships between different moving objects.

MATERIALS

Stopwatch or phone timer
metric tape measure

1 strip of masking tape
5 beanbags

PROCEDURE

- 1) Go to your assigned location. Place the masking tape on the floor. This will be your starting point.
- 2) Now for the walking...One student will walk from the starting point toward the end of the hallway, another will start the timer and call out each 3 second interval. The walker should drop one beanbag at each 3 second interval for a total of 15 seconds.
- 3) Ready...Set...Walk! (in a straight line)
- 4) Measure and record the distance (**to the nearest cm**) from one beanbag to the next
This is the interval displacement.

******Have your teacher approve your first set of data before you move your beanbags******

- 5) Repeat for each group member.

| Time interval (s) | Displacement (cm) | Total Time (s) | Total Distance (cm) |
|-------------------|-------------------|----------------|---------------------|
| 0 | 0 | 0 | 0 |
| 0 - 3 | | 3 | |
| 3 - 6 | | 6 | |
| 6 - 9 | | 9 | |
| 9 - 12 | | 12 | |
| 12 - 15 | | 15 | |

Data
Approval

Analysis

- 1) Was the total time for **each person** the same? Explain why.
- 2) Were each of **your** interval displacements the same? Explain why.
- 3) Explain which is the independent and dependent variable of this experiment?
- 4) Calculate your total distance travelled from the start to each beanbag. Explain how you determined the distances.

Your teacher needs to approve your work before you continue.

- 5) Calculate the average speed for your entire walk. Show your work.
- 6) Which group member had the fastest average speed? the slowest average speed?
- 7) How did you determine which person was fastest?

Your teacher needs to approve your work before you continue.

- 8) Construct a **distance v. time graph** for your data as well as two other group members on the same graph. Use the slowest racer to set your time scale. Draw a best fit line through your data points.

Your teacher needs to approve your graph before you continue.

- 9) How does the graph show which racer was the fastest and slowest?
- 10) Did each racer race at a consistent speed throughout the intervals? How does the graph show this?