...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   1 strip of masking tape
metric tape measure   5 beanbags

PROCEDURE

1) Go to your assigned location. Place the strip of 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 the start to the first beanbag. This is the interval displacement from 0 – 3 seconds.

5) Measure and record the distance from the first beanbag to the next beanbag. This is the interval displacement from 3 – 6 seconds.

6) Continue by measuring and recording all interval displacements.

Have your teacher approve your data before you move your beanbags

7) Repeat for each group member.

Time interval (s)	Interval Displacement (cm)		Total Time (s)	Total Distance (cm)
0	0		0	0
0 - 3		←	3	
3 - 6		Data Approval	6	
6 - 9			9	
9 - 12		←	12	
12 - 15			15	

Analysis

1) Explain which is the independent and dependent variable of this experiment?

2) Was the total time for **each person** the same? Explain why.

3) Were each of **your** interval displacements the same? Explain why.

4) Calculate your total distance travelled from the start (masking tape) to each beanbag. Explain how you determined the total distance to each beanbag.

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 fastest person's data to set your distance 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 person was the fastest and slowest?

10) Did each person walk at a consistent speed throughout the intervals? How does the graph show this?