Science 10

# Walk This Way

**Purpose:**
To determine the average velocity of several individuals moving at different speeds and directions.

**Procedure:**
See Pages 372-3 in "BC Science 10" (Conduct an Investigation 8-2E "Walk This Way")
Note: additional trials will be recorded as indicated by the data tables below.

**Data Tables:**

| **Walking Forward** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Position (m)** | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| **Time (s)** | 0 | 3.06 | 6.52 | 10.27 | 12.61 | 15.7 | 18.9 | 21.96 | 25.06 | 28.59 | 31.5 |

| **Jogging Forward** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Position (m)** | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| **Time (s)** | 0 | 2.0 | 3.65 | 5.34 | 6.71 | 8.36 | 9.9 | 11.58 | 12.87 | 14.75 | 16.8 |

| **Running Forward** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Position (m)** | 0 | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |
| **Time (s)** | 0 | 1.33 | 2.03 | 2.25 | 3.41 | 4.01 | 4.6 | 5.33 | 5.17 | 6.67 | 7.5 |

| **Walking Backward** | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Position (m)** | 50 | 45 | 40 | 35 | 30 | 25 | 20 | 15 | 10 | 5 | 0 |
| **Time (s)** | 0 | 3.51 | 6.62 | 10.19 | 13.71 | 17.01 | 21.66 | 25.36 | 28.61 | 32.73 | 35.8 |

Science 10

Name:_____
Block:____ Date:_____

**Analysis of Results:**

1. On the same set of axes, plot a position-time graph for all 4 sets of data.

2. On the graph:
   a. Draw a best-fit line for each set of data.

   b. Calculate the slope of each of the best fit lines. (make sure to include units)

3. What is the average velocity of the student…
   a. Walking forward?

   b. Jogging forward?

   c. Running forward?

   d. Walking backward?

4. Was the average speed of the student faster when walking forward or backward?

5. Did any of the students have perfectly uniform motion while walking, jogging or running forward or backward? Use your graph to justify your answer.

**Conclusion:**

What can you infer about the slope of a position-time graph of an object's and its average velocity? Include comments about the steepness of the slope and whether it is positive or negative.