

Stepping for Miles



Strands:

Number & Quantity	
Algebra	X
Functions	X
Geometry	
Statistics & Probability	



Materials:

- Parachute cord marked 10 ft, 20 ft, and 30 ft
- *Stepping for Miles* chart
- Graph paper
- Colored pencils

Where:

Outside	
Inside	X
On-line	
On-site	

By only running 30 feet, you can determine how many steps you would take to run a marathon (26.2 miles), as you explore ratios and conversions in this activity for 6th through 8th grade learners.

Set-Up:

- Work with another person.
- Lay the cord in a straight line and tape it down. Determine a starting line.
- Mark the cord with tape at 10 ft intervals: 10 ft, 20 ft, and 30ft. These marks are your check points.

Think About It:

- a. How many steps do you take to go from your front door to the end of your driveway?
 - b. How far do you think that is?
- When runners participate in marathons, they run 26.2 miles to complete a race. Based on your response to problem 1, how can you figure out how many steps you would take if you ran a marathon?
- a. On a trip to New York City, a teacher and her class walked all around the city. The teacher wore a pedometer. She knows that she takes 2000 steps in 1 mile. On the 3rd day of the trip the pedometer informed the students that they had taken 28,376 steps. How far did the students walk?
 - b. Write at least one sentence explaining how you could solve the problem. Create an equation to solve the problem and solve it.

Exploration:

- Line up at the starting line.
- Walk to the 30 ft line counting aloud the number of steps you take. A step is anytime a foot touches the ground. Your partner records the number of steps in the *Stepping for Miles* Chart as you pass each checkpoint. Return to the starting line.
- Repeat step 2, this time jogging from the starting line to the finish line. Return to the starting line.
- Repeat step 2, this time running from the starting line to the finish line. It is helpful to work with another pair of students to accurately record the steps of the runner. One person runs and one person stands at each check point recording the number of steps it takes the runner to get to that checkpoint.
- Switch roles with your partner. Repeat Steps 1 through 4.
- Plot the data in the graph provided in the *Stepping for Miles* Chart.
 - Determine a scale that allows all of your data to fit on the graph.
 - Use three different colors to draw your graphs: one color for walking, one for jogging, and one for running. Include a key.
 - What do you notice about your graphs? Think about how fast you moved to create each one.
- Compare your graphs with your partner's graphs. What do you notice?
- Without measuring directly, decide how many steps you would take in 40 ft for each mode of travel.
- Use your graphs and table to determine equations for each of your graphs.
- The number of steps you take in a certain distance depends on the length of your stride. (Stride length is the length of one step.) How can you use the data in your table to determine your stride length?
- Use the data in your table to determine your stride lengths, one for walking, one for jogging, and one for running.

**Think More About It:**

12. How many steps would you take in 100 feet? How do you know?
13. There are 5,280 feet in a mile. How many steps would you take in a mile?
14. There are 3.1 miles in a 5K race.
 - a. How many steps would you take if you walked a 5K?
 - b. How many steps would you take if you ran a 5k?
15. There are 26.2 miles in a marathon. How many steps would you take in a marathon?
16. How far do you think you would travel in 2,000 steps?
17. Go to the wall furthest from the door. Count the number of steps it takes you to get to the door. Use this number to determine how far the wall is from the door.

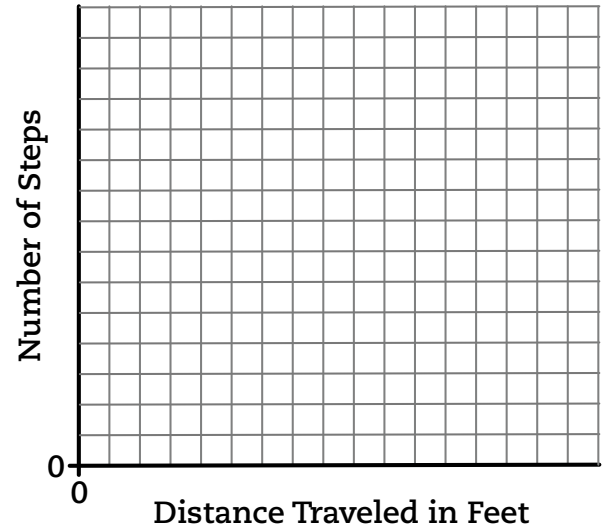
Explore More:

18. Pick either running or walking. Find a large space. Have someone time you as you run or walk for 10 seconds counting the steps that you take. Record the number.
19. Use your table, graph, or equation to figure out how far you went in those 10 seconds.
20. Based on the distance you traveled in 10 seconds, and the problems you solved earlier, how long do you think it would take you to run a mile?
21. How long do you think it would take you to run a 5K?
22. How long do you think it would take you to run a marathon?
23. The men's marathon world record is 2:03:38. The women's marathon world record is 2:15:25. Do your responses seem realistic? Why or why not?
24. In Michigan, the fastest 2012 middle school mile time for boys was 4:40. The fastest middle school mile time for girls was 5:29.
<http://www.athletic.net/TrackandField/Division/Best.aspx?DivID=35185>
Should you join the cross-country team?

Stepping for Miles Chart

Directions: For each mode of travel, record the number of steps it took for the traveler to reach each distance. Using a different color for each data set, graph the data for each mode of travel. Include the point, (0, 0) in each graph.

Mode of Travel	10 ft	20 ft	30 ft	Equation
Walking				
Jogging				
Running				



Mode of Travel	10 ft	20 ft	30 ft	Equation
Walking				
Jogging				
Running				

