

Experiment 10  
**Walking the  
Plank**

Teaching Notes

In this experiment, the weight of a student is a linear function of the distance of the student from the scale. The distance to the scale end of the plank is the *independent variable*, and the weight of student is the *dependent variable*. This experiment produces a line with a negative slope, and both the  $x$ - and  $y$ -intercept have physical significance.

**Equipment**

bathroom scale, 1 per group

*Number the scales.*

plank or board, 2" thick by 6" wide and at least 7' long, 1 per group

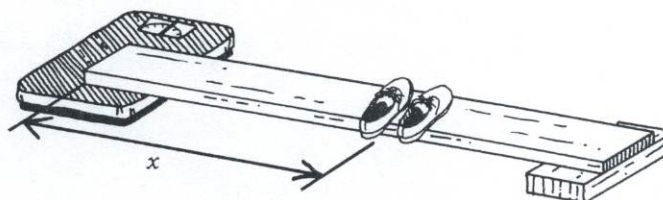
*Number the planks.*

yardstick or tape measure, 1 per group

graph paper, 1 sheet per student

**Procedure**

Have groups put one end of the plank on the scale (in the middle of the scale). Support the other end of the plank with a brick or a block of wood about the same height as the scale. Explain that one student will stand on the plank, and the other will measure the distance to the scale end of the plank and record the weight. Remind the groups that the same student must walk the plank for the entire experiment.



Make sure students are consistent when measuring the distance from their feet to the scale end of the plank (for example, always measure from the left foot).

Experiment 10

# Walking the Plank

## Collect the Data

Name \_\_\_\_\_

Partner \_\_\_\_\_

Draw a diagram of the experiment, indicating variables

Describe the procedure for the experiment.

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The independent variable,  $x$ , is \_\_\_\_\_ Units \_\_\_\_\_

The dependent variable,  $y$ , is \_\_\_\_\_ Units \_\_\_\_\_

Equipment (labels and measurements)

Plank number \_\_\_\_\_

Scale number \_\_\_\_\_

Length \_\_\_\_\_

Data Collection		Second set of data (Question 6)
Independent	Dependent	

Points to Be Graphed	
$x$	$y$

(Second set)	
$x$	$y$



Name \_\_\_\_\_

### Find the Equation

After plotting your data on graph paper, draw a straight line through two of your points. Choose the line that best fits your data. Circle the points on your graph and copy their coordinates below.

Your points: (\_\_\_\_, \_\_\_\_ ) and (\_\_\_\_, \_\_\_\_ )

Use these points to find the equation of your line. Show your work.

Find the slope of the line.

Find the  $y$ -intercept of the line.

Write the equation of the line.

$$y = \frac{\quad}{\quad} x + \frac{\quad}{\quad}$$

*rational form*

$$y = \frac{\quad}{\quad} x + \frac{\quad}{\quad}$$

*decimal form*

Rewrite the decimal form of the equation, using the names of the variables instead of  $x$  and  $y$ .

$$\frac{\quad}{\quad} = \frac{\quad}{\quad} + \frac{\quad}{\quad}$$

Experiment 10

# Walking the Plank

Name \_\_\_\_\_

## Interpret the Data

Write the decimal form of your equation here.  $y = \underline{\hspace{2cm}}x + \underline{\hspace{2cm}}$

Use this equation to answer the questions. Show your work.

1. What weight will be recorded if the person is 5.25 feet away from the scale?  
\_\_\_\_\_

2. If the scale shows a weight of 75 pounds, how far away is the student from the scale end of the plank? \_\_\_\_\_

3. If the scale shows a weight of 52 pounds, how far away is the student from the scale end of the plank? \_\_\_\_\_

4. As the student moves farther and farther from the scale, what happens to the reading?  
\_\_\_\_\_  
\_\_\_\_\_

5. Study the graph to the right.

Determine the weight of the person walking the plank. \_\_\_\_\_

Determine the length of the plank. \_\_\_\_\_

6. Change roles with your partner and collect another set of data. Plot the second set of points on your graph paper and draw a line. What do the lines have in common? \_\_\_\_\_

Why? \_\_\_\_\_

