

# What the Graph Tells

## Purpose

Students will use information taken from a graph or equation to answer questions about a problem situation.

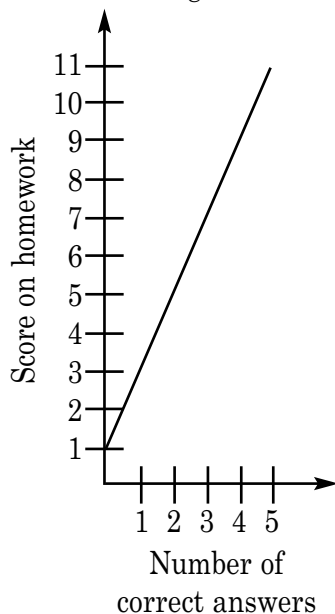
## Materials

*For the teacher:* transparency copy of graph paper, overhead projector  
*For each student:* copy of Black Line Master (BLM) *What Does It All Mean?*

## Activity

### A. Introduction

1. Tell students that they will be learning how to find information on a graph, understand how a linear equation relates to the graph, and what the different parts of a graph represent.
2. Draw an enlarged version of the graph below on the chalkboard.



3. Tell the students that for a math homework assignment, a teacher promised to give one point for simply completing the assignment and two points for each correct answer. There were five problems on the assignment. Explain that the graph shows the score a student would receive based on the number of correct answers.

*(continued)*



## connecting across the curriculum

### Science

Explain that predictions are often made using a graph. Tell students that the "Linear Plant" has a growth rate that follows the equation: Height of Plant in Inches = 3 (Age of Plant in Months) + 1. Have students write an equation using  $x$  and  $y$ , graph the line that fits the equation, and use the line to find how tall the plant will be after six months.



## EXTENDING THE ACTIVITY

Provide students with graphs in newspapers, magazines, and books. Have them answer and write questions based on those graphs. Provide linear equations for any graphs that are linear and have students check their answers to the questions.

### Standards Links

**5.2.1, 5.7.1, 5.7.7, 5.7.9**

**Activity (continued)**

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4. Have students find specific scores, given a number of correct answers and have students find the number of correct answers, given a student score. Discuss why the graph begins at “1” on the  $y$ -axis.
5. Tell students that the linear equation for this graph is  $y = 2x + 1$ . By using  $y =$  “score on the homework” and  $x =$  “the number of correct answers,” discuss why that equation is correct and how it relates to the headings of the  $x$ - and  $y$ -axes. Have students check their findings from step 3 by substitution in the linear equation.

**B. Group Activity**






1. Divide class into groups of two.
2. Hand each student a copy of the BLM *What Does It All Mean?*
3. Demonstrate how to answer the questions by extracting information from a graph by using the Example problem on the BLM (leave the students to complete the Example).
4. Have students work with their partners to complete the BLM and discuss answers as a class.

**Questions for Review**

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**Basic Concepts and Processes**

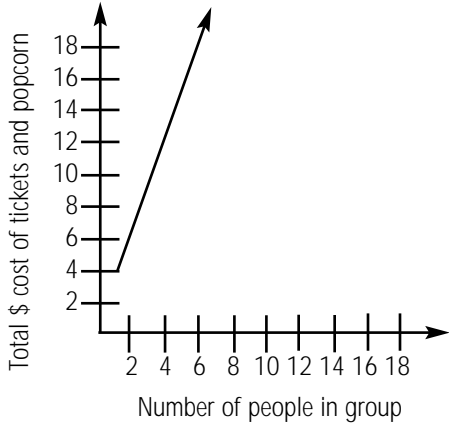
During the Group Activity and post-activity discussion, ask the following questions:

-  Were you able to answer the questions correctly by reading information on the graph?
  -  Show me how you found the answer for one of the questions.
  -  When you checked your answers using the linear equations, did you find the same answers as you did from the graph?
  -  Show me how you used substitution to check one of your answers.
  -  How can you tell what the  $x$  in the linear equation represents by looking at the graph?
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## What Does It All Mean?

Answer the questions about each graph and plot the points that show where you found your answers. Identify what  $x$  and  $y$  represent based on the graph. Check your answers by substitution in the given linear equations. Show your work on the back of the sheet.

**Example:**



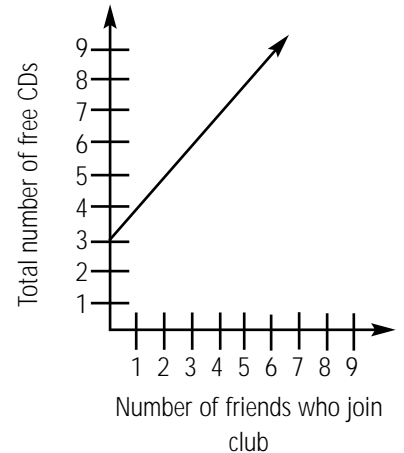
A local theater has a special once a month so that a group of people can purchase tickets for \$2 each and the entire group can have all-you-can-eat popcorn for only \$2. Using the graph, answer the questions below.

**E1.** How much would a group of 2 people pay for tickets and popcorn? Plot the point that shows where you found your answer.

**E2.**  $x =$  \_\_\_\_\_  $y =$  \_\_\_\_\_

**E3.** The linear equation that represents this situation is  $y = 2x + 2$ . Check your answer above using substitution in the linear equation.

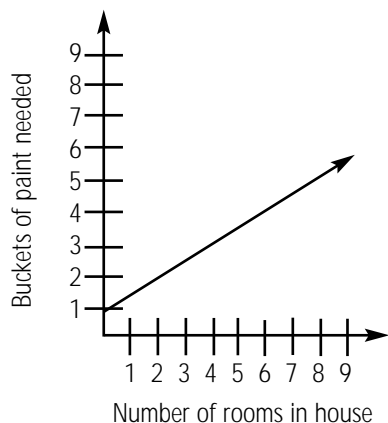
Josette joins CD ClubHouse. The graph to the left shows the number of CDs Josette will receive given the number of friends who join the club. Using the graph, answer the questions below.



**1.** How many CDs would Josette receive if four friends join? Plot the point that shows where you found your answer.

**2.**  $x =$  \_\_\_\_\_  $y =$  \_\_\_\_\_

**3.** The linear equation that represents this situation is  $y = x + 3$ . Check your answer above using substitution in the linear equation.



Jacob is painting houses for the summer. He paints the trim in an entire house, plus the walls in each room. The graph shows how many buckets of paint he needs based on the number of rooms in the house. Using the graph, answer the questions below.

**4.** How many buckets of paint will Jacob need if a house has 6 rooms? Plot the point that shows where you found your answer.

**5.**  $x =$  \_\_\_\_\_  $y =$  \_\_\_\_\_

**6.** The linear equation that represents this situation is  $y = \frac{1}{2}x + 1$ . Check your answer above using substitution in the linear equation.

# What Does It All Mean?

## Teacher Directions

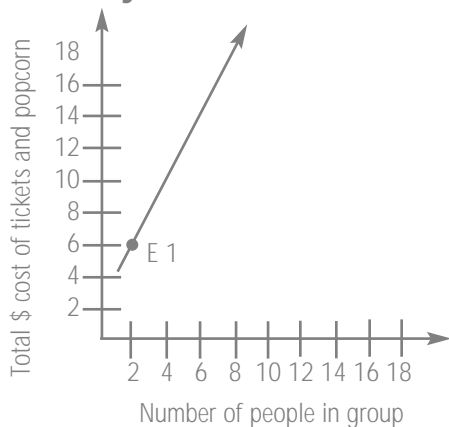
Distribute one copy of the BLM *What Does It All Mean?* to each student.

Do the example problem together as a class, and instruct students to complete the other two problems with their partners.

Have students find the answers to the problem situations by reading the graphs associated with each situation. Instruct students to identify what  $x$  and  $y$  represent by looking at the labeling of the axes.

Have students check answers by substituting them in the linear equation associated with each graph.

## Answer Key



E1. \$6

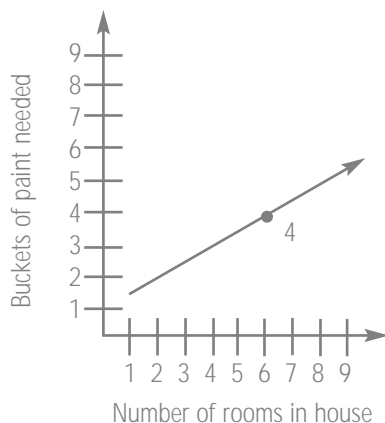
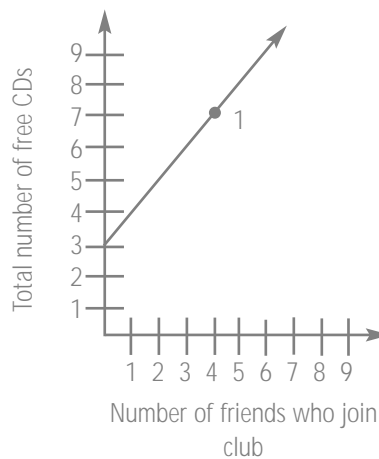
E2.  $x = \frac{\text{Number of people in group}}{\text{Cost of tickets plus popcorn}}$

E3.  $y = 2(2) + 2$   
 $y = 4 + 2$   
 $y = 6$

1. \$7

2.  $x = \frac{\text{Number of friends joining}}{\text{Number of free CDs}}$

3.  $y = 4 + 3$   
 $y = 7$



4. 4 buckets

5.  $x = \frac{\text{Number of rooms in house}}{\text{Buckets of paint needed}}$

6.  $y = \frac{1}{2}(6) + 1$   
 $y = 3 + 1$   
 $y = 4$