

## Learning Project 1 The Number Line and Informational Graphing

### Inquiry Activity 1-1: Reading a bar graph

*(Note: Italicized portions should be directed to students.)*

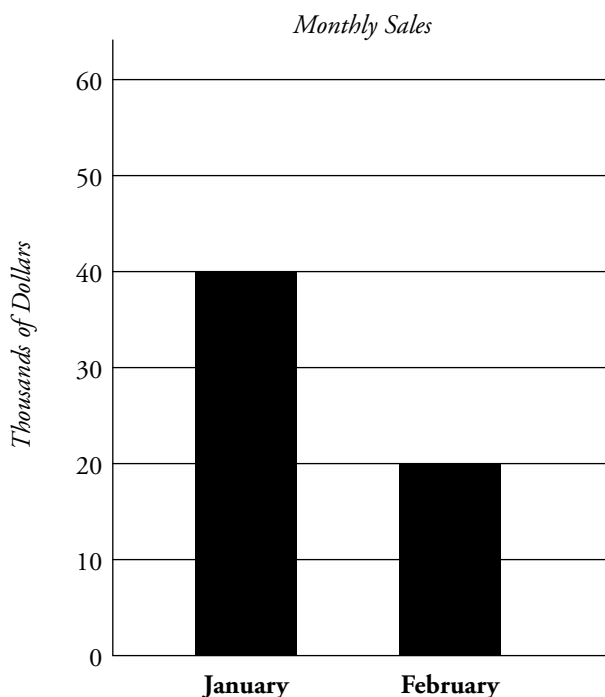
#### 1. Identifying the Problem (Item #1, PA) Calculator allowed. (Teacher directed)

It is recommended that the following alternate question be used for this initial Inquiry Activity. It focuses only on the goals for this Learning Project, which should be relatively simple for most learners. It allows the learner to become familiar with the learning process before the mathematical topics get confusing. Later, in Learning Project # 5, you will re-introduce this stimulus using the original question about finding the average.

*Read the question carefully, as you would if taking the actual test.*

Kelly's goal is to average \$25,000 per month in sales for the first three months of the year. Her sales for January and February are shown in the graph below.

**Calculator  
Allowed**



(Alternate) question

What is the amount, in dollars, of her sales after these two months?

Mark your answer in the circles in the grid.

(Provide an answer grid on a separate sheet of paper.)



(Original Question: Do not use this one now unless you think your class can handle it this early in the class. You will return to this stimulus in Learning Project #5.)

To reach her goal, what is the minimum amount of sales Kelly must make in March?

- 1) \$15,000
- 2) \$24,960
- 3) \$30,000
- 4) \$35,000
- 5) \$60,000

*Here are some clarification questions you may want to consider when reading test questions.*

*What words and/or symbols might be important to understand to answer this problem and what are they telling you?*

You can't know what words the learner will choose here, but "average" is an important word.

*What words and/or symbols are unfamiliar and what do you think they mean?*

## 2. Becoming Familiar with the Problem

Eventually, the individual learner will be working alone on steps 1-3. However, you may want to guide the class for this first activity.

The following questions are general ones, recommended as first steps whenever a graph is being read. They are good questions to ask during test-taking as well.

*Ask yourself questions like these about the problem, taking note of the ones that were especially helpful so that you can remember to use them when you take the test.*

*Re-read the question. What are you being asked to find?*

*Read the title of the graph and the labels on the sides. What facts do the bars tell you?*

## 3. Planning, Assigning and Performing Tasks

*Try to answer the test question any way you can, even if you have to guess, but try to be aware of the reasoning and operations that you are using. The following questions can be helpful.*

*What is the problem asking you to do in terms of mathematics? Bring things together, separate things, or compare things?*

The intent of this question is to make students aware of the different mathematical operations that certain kinds of situations demand. It will help them to know *when* to add, subtract, multiply or divide.

*Find an answer.*

*Is your answer reasonable?*

*Be ready to defend your answer and the way that you found it.*

## 4. Sharing with Others

*Telling other people what you know helps you to understand the material better. So take this opportunity not only to share the knowledge, but also to learn it more completely.*

*Small Groups: Compare your answer to others in the group, and explain why and how you found it and why you think yours is correct.*

Agree on the correct answer and the steps you would recommend for solving this problem. Include how you read the values from the graph. Write them as step 1, step 2, etc.

Write a mathematical expression that shows what your group did to find the correct answer.

**Whole class:** Report to the class the steps you decided to use in order to answer this question, as well as the mathematical expression that summarizes them.

Take notes on any different ways that others used to find the answer.

Opportunities may arise here to talk about the Commutative Property of Addition,

$$20,000 + 40,000 = 40,000 + 20,000$$

(When you add, the order does not make any difference.)

or even the Distributive Property of Multiplication over Addition,

$$1000(20 + 40) = 20,000 + 40,000.$$

(You could add the 20 and 40 first and then multiply by 1000 or you could multiply each of them by 1000 first and then add them.)

## 5. Reflecting, Extending and Evaluating

**Reflecting:** *Think about what you learned.* (A group or instructor led activity)

*Here are some questions to start you thinking about the experience you just had. Thinking about what you have learned and experienced is part of the learning process. When the focus is only on the answer, you don't get much time to think about what was learned.*

Lead a discussion of the elements in the structure of bar graphs by asking about this particular one. The title, vertical and horizontal scales, and the length of the bars combine to report the facts in a visual way. The length and position of the bars provide the connection between the axes. Ask if everyone had noticed that the vertical scale was in thousands of dollars - an important detail. Discuss the added impact that the visual graph has over listing the same data. For example, a viewer would notice immediately that the sales for January are greater (actually double) the sales for February, whereas that would not have been apparent when listed.

*How did you know to add the numbers?*

The question was asking to bring two things together.

*What if the question had been, "How much more did she sell in January?" Write the mathematical expression that shows what you would have done to find the answer.*

They should write,  $40,000 - 20,000$ , making sure that it is in that order. (Subtraction is not commutative)

**Extending:** *Extend what you learned to new situations.*

*In extending, you are being asked to transfer the information presented in the Practice Test question to other information or situations you already know and maybe make new connections to other information.*

Supervise the groups as they scan through the newspapers and magazines in the classroom looking for other graphs that share the rectangular format (have vertical and horizontal axes.) Ask them to choose one of the graphs and answer questions similar to these.

*List 3 facts that this graph is reporting.*

*What overall story does the graph tell?*

*Make up a question about this graph that might be on the GED test and exchange it with other groups to answer.*



*What are the average monthly sales for these two months?*

You could also ask an additional question about this particular stimulus that would provide a foundation for Learning Project # 5 when they will see it again. Use their answers as a pre-assessment of their skills so that you can be prepared for that topic.

***Evaluating: Assess what you learned and how you learned it.***

***In this last step, you get a chance to review the content of what you learned and the methods used to learn. There are no right or wrong answers to these questions; it is your chance to look more closely at your learning style and the opportunity to state how you benefited or did not benefit from the content and/or the methods to help you pass the GED test.***

Remind the students that the 5-step process for solving the GED problems they have completed here will be repeated for the others that follow. Point out that steps 1 – 3 are also the steps they should follow when they are actually taking the GED test.

*How did the test-taking and learning steps and procedures and 5-step format used in these Inquiry Activities work for your learning?*

*Which particular questions that were asked made you realize what you needed to do?*

*How could we make it work better?*