

Activity 1

Creating Word Problems

Concepts/Skills

- ◆ Computation
- ◆ Problem solving

Materials

- ◆ TI-15
- ◆ Student Activity pages (pp. 3 - 8)
- ◆ *Math Curse* by Jon Scieszka and Linda Ward Beech : Viking Childrens Books
© October, 1995: ISBN 0670861944
- ◆ Poster paper
- ◆ Markers
- ◆ 1-inch color tiles or paper squares
- ◆ Using the TI-15 (p. 9)

Overview

Students will write word problems based on whole numbers generated by the TI-15. The problems will use context clues to indicate which operation to use to solve each word problem. Students will analyze problems they create to determine the problem characteristics when using operations on whole numbers.

Focus

- ◆ Read the book *Math Curse* to the students. Have students describe the types of problems faced by the main character of the book.
- ◆ Write the number **16** on the overhead projector or board. Tell students that this number is the answer to a problem. Have them determine problems that could have 16 as an answer. Record the problems as students give them.
- ◆ Select one of the problems given, such as **4 x 4**. Give students a context for the problem such as, "Timothy was making a drink coaster out of 1-inch tiles. The coaster was a 4-inch square. How many 1-inch tiles did Timothy need to make one coaster?" Discuss with students how the operation of multiplication is reflected in the word problem. (This is an area problem. There are 4 groups of 4 tiles each. Each group represents one row of tiles on the coaster.)

First Things First

For students not ready for open-ended problems, start with the *First Things First* activity page.

Presenting the Problem

1. Set the TI-15 to Problem Solving manual mode and enter the problem, $16 ? 2 = 32$.
 - a. Press $\diamond$.
 - b. Press Mode to display the **MODE** menu.
 - c. Press $\blacktriangleright$ to select **MAN**, then press Enter .
 - d. Press Mode to exit the **MODE** menu.
 - e. Press $1\ 6\ ?\ 2\ \text{Enter}\ 3\ 2\ \text{Enter}$.
2. Discuss with the students how to determine the correct operation. Enter the operation $\times$ and press Enter .
3. Show students this problem and discuss how it corresponds to the number sentence on the calculator.

Mrs. Fibonacci has 16 students this year. She wants to give each of her students two pencils. How many pencils does she need?

4. Discuss the problem on the *Creating Word Problems* activity page with the students. Make sure that the students understand the final product they are to create. Model for them the format for each problem: the number sentence created by the TI-15 with the question mark in place of the operator followed by the word problem created by the team.

Evaluating the Results

After the presentations have been made, have the students discuss the different problems presented. Have them look for similarities between problems using the same operation.

Have students generate a list of characteristics for each type of problem.

Discuss with the students the difficulty of choosing the correct operation when using the TI-15 to generate the problems. Ask the students if there were any specific problems the team had when trying to determine the correct operation.



Name _____

Date _____

Activity 1

Creating Word Problems: First Things First

The Problem

How do you decide which operation you need to solve an equation?

Working the Problem

1. Look at this problem: $14 ? 2 = 16$

Is the solution larger or smaller than the other numbers in the equation?

Circle the operations that give you larger solutions when using whole numbers. $+$ $-$ $\times$ $\div$ How do you know?

Circle the operations that give you smaller solutions when using whole numbers. $+$ $-$ $\times$ $\div$ How do you know?

Use your TI-15 to try each of the operations with these numbers. Write the solutions in this table.

Press	Result
14 $+$ 2 $\underline{\text{Enter}}$	
14 $-$ 2 $\underline{\text{Enter}}$	
14 $\times$ 2 $\underline{\text{Enter}}$	
14 $\div$ 2 $\underline{\text{Enter}}$	

Which operations gave larger solutions?

Which operations gave smaller solutions?

Which operation gave the solution you needed?

To write a word problem for an addition equation, use similar objects for each set. The set of 14 and the set of 2 need to be combined in some way. For example, Juan had 14 marbles. He found 2 more marbles.

How many does he have now? The 14 marbles and 2 marbles are combined to make a total of 16 marbles.

Write your own word problem for this equation.

2. Look at this equation: $1000 \div 50 = 20$

Is the solution larger or smaller than the other numbers in the equation?

Use your TI-15 to try each of the operations with these numbers. Write the solutions in this table.

Press	Result
1000 $+$ 50 Enter	
1000 $-$ 50 Enter	
1000 $\times$ 50 Enter	
1000 $\div$ 50 Enter	

Which operations gave larger solutions?

Which operations gave smaller solutions?

Which operation gave the solution you needed?

To write a word problem for a division equation, one number is the total number of objects, one number is the number of objects in one group, and one number is the total number of groups. The largest number is usually the number of objects. The objects are separated into equal groups. For example: Maria has 1000 pencils in the school store. She wants to put them into boxes that hold 20 pencils each. How many boxes will she need? The 1000 pencils are the objects. There are 20 pencils in each group. She will need 50 boxes, therefore 50 is the number of groups.

Write your own word problem for this equation.

3. Sometimes the solution number is between the other equation numbers. Look at this equation: $150 \div 50 = 100$

Which operation will give a solution that is smaller than one of the numbers in the equation?

Use your TI-15 to try each of the operations with these numbers. Write the solutions in this table.

Press	Result
150 $+$ 50 Enter	
150 $-$ 50 Enter	
150 $\times$ 50 Enter	
150 $\div$ 50 Enter	

Which operation gave the largest solution?

Which operation gave the smallest solution?

Which operation gave the solution you needed?

To write a subtraction equation, use similar objects. The largest number is separated into the part that is subtracted and the part that remains. For example: Mr. Wong had 150 stamps. He used 50 stamps on birthday cards for his friends. How many stamps does he have now? The 150 stamps are the largest number of objects. The 50 stamps on the birthday cards are the subtracted objects. The solution is the 100 stamps he has left.

Write your own word problem using this equation.

4. Look at this problem: $250 \ ? \ 50 = 12500$

Which operation do you think will give this solution? Why do you think so?

Use your TI-15 to try each of the operations with these numbers. Write the solutions in this table.

Press	Result
250 $\boxed{+}$ 50 $\boxed{\text{Enter}}$	
250 $\boxed{-}$ 50 $\boxed{\text{Enter}}$	
250 $\boxed{\times}$ 50 $\boxed{\text{Enter}}$	
250 $\boxed{\div}$ 50 $\boxed{\text{Enter}}$	

Which operation gave the largest solution?

Which operation gave the smallest solution?

Which operation gave the solution you needed?

Use objects and groups of objects in your word problem to write a multiplication equation. The solution will be the total number of objects. For example: Demetrius is in charge of the prizes for the school carnival. Each booth will need 250 small prizes. There are 50 booths at the carnival. How many prizes does Demetrius need to buy? The prizes are the objects. The booths are the groups of objects.

Write your own word problem for this equation.



Name _____
Date _____

Activity 1

Creating Word Problems

The Problem: Creating Word Problems

Mrs. Fibonacci is tired of making up math problems for her students to solve. She wants your team to create some problems for her. Use the TI-15 to help you find the numbers for the problems, and then create the words for the problems.

The Facts

- ◆ Set to the Problem Solving mode, manual, level 2 or 3. Set the operation to ?. (See *Using the TI-15*.)
- ◆ The TI-15 will give the numbers for the problem. You decide which operation gives you the answer shown on the TI-15.
- ◆ For most sets of numbers, only one operation will give you the answer given on the TI-15.
- ◆ Word problems describe the situation where a particular operation is needed. For example, an addition problem will describe putting two or more sets together in some way.

The Task

1. Your team will:
 - Use the TI-15 to give you the numbers for five problems.
 - Decide which operation will give the answer displayed on the TI-15 for each problem.
 - Write a word problem that matches each problem and the operation the team has chosen for each.
2. Make a poster of the five problems your team has created. For each problem:
 - Show the number sentence with the question mark given by the TI-15.
 - Show the word problem written by your team.
 - Do not show the operation needed to solve the problem.

3. Each person on the team will write an explanation of the team's solution. This explanation will answer the following questions:
 - How did your team decide which operation to use for each equation?
 - How did the size of the answer to the number sentence help your team?
 - How did the operation help you write the word problems?
 - What happens in an addition problem? A subtraction problem? A multiplication problem? A division problem?
 - If you are given a word problem, how do you decide which operation to use?
4. Your team will present your five problems. The rest of the class will decide which operation is needed to solve each problem.



Using the TI-15

Activity 1

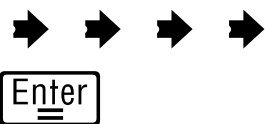
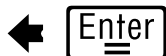
Creating Word Problems

To set up the problems for Activity 1:

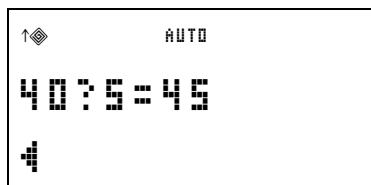
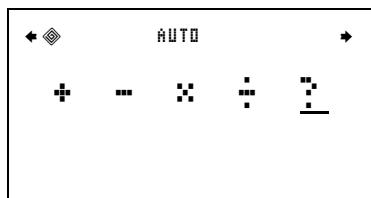
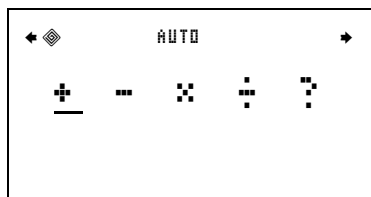
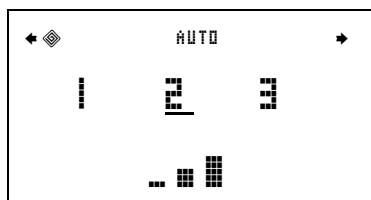
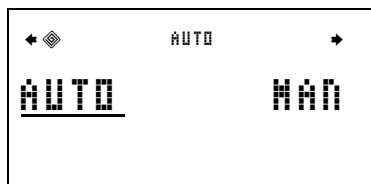
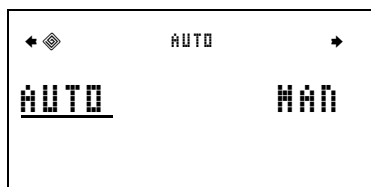


Mode

If auto is not
underlined:



Mode



Problems are random.