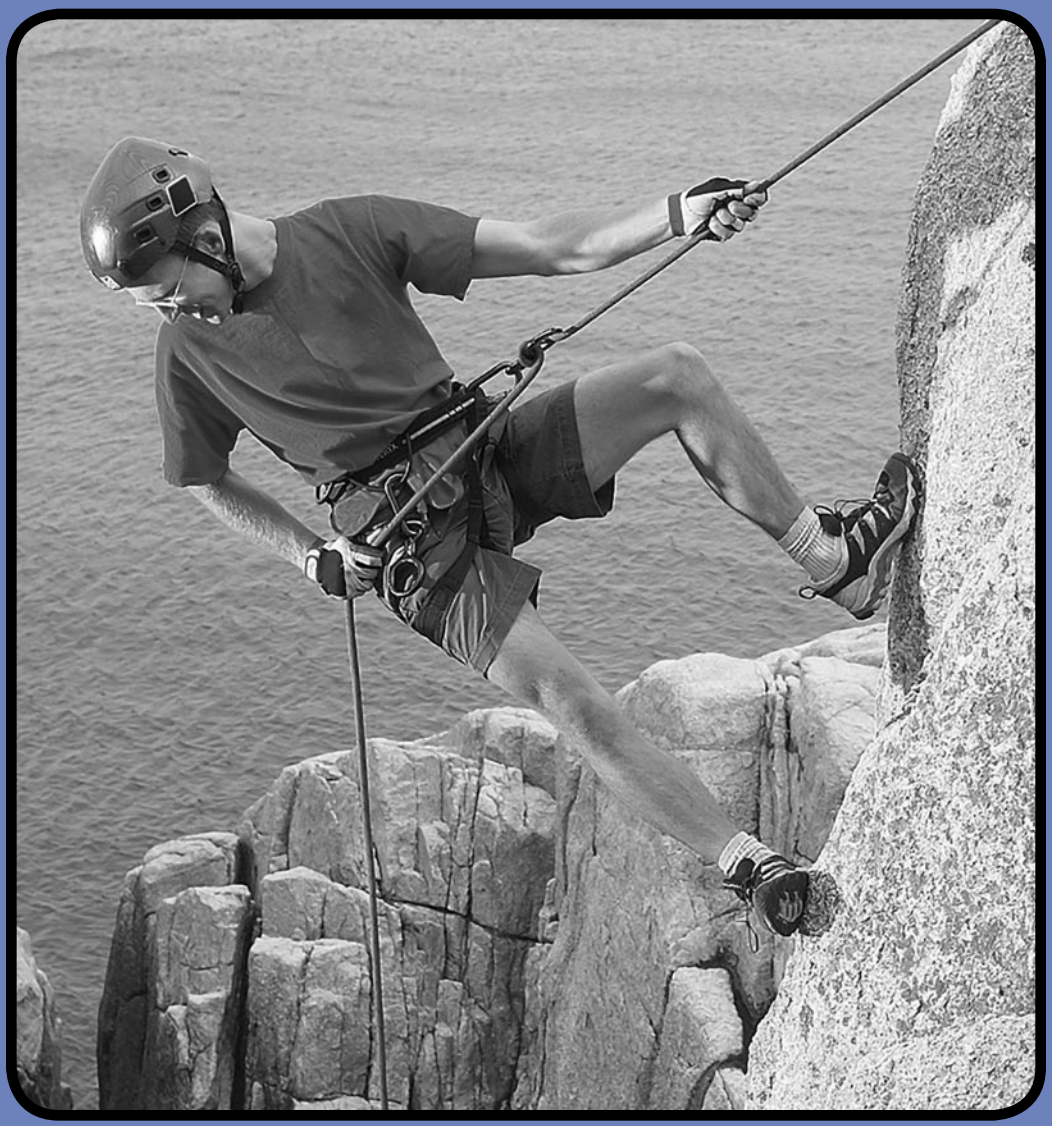
STEP BY STEP MATH

# Strategies for Solving Word Problems

## BOOK G



- *Teaches six basic strategies for solving word problems successfully*
- *Builds on the step-by-step problem-solving process*
- *Improves problem-solving skills and strengthens mathematical reasoning*
- *Provides practice with extended-response problems*

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# To the Student

***Strategies for Solving Word Problems*** will help you more easily solve word problems in math. In this book, you will learn six math strategies—plans for finding solutions to word problems. The strategies are taught as part of a six-step process. You will learn how to choose and use the best strategy, step by step, to solve a word problem. This book has six lessons. In each lesson, you will see how one strategy can be used to solve word problems. With help, you will practice the strategy. After the lessons, you will use the six strategies to solve word problems on your own. Ask your teacher any time you have questions about your work.

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# An Introduction to the Program

***Strategies for Solving Word Problems*** provides practice using six math strategies: Draw a Diagram, Find a Pattern, Act It Out, Make a Table, Write an Equation, and Guess and Check. These strategies can help you find solutions to word problems, but you need to know when to use each strategy and how to use it. This chart gives an overview of the six strategies.

| Strategy | When to Use It | How to Use It |
|---|---|---|
| 1. Draw a Diagram | • The problem gives information that can be shown in a diagram.<br>• The question asks for a solution that can be found by using the diagram. | 1. Find the information needed for the diagram.<br>2. Draw and label the diagram with information from the problem.<br>3. Use the diagram to answer the question. |
| 2. Find a Pattern | • The problem gives information that follows a pattern.<br>• The question asks for a solution related to the pattern. | 1. Find the information that follows a pattern.<br>2. Find the rule for the pattern.<br>3. Use the rule to solve the problem. |
| 3. Act It Out | • The problem gives information that can be acted out.<br>• The question asks for a solution that can be found by acting something out. | 1. Find the information that can be acted out.<br>2. Act out the information in as many ways as possible.<br>3. Choose the way that answers the question. |
| 4. Make a Table | • The problem gives more than one set of data.<br>• The question asks for the data to be continued. | 1. List the sets of data.<br>2. Make a table of the data. Circle the information needed to answer the question. |
| 5. Write an Equation | • The problem tells about a situation.<br>• The question asks for an unknown amount. | 1. Write what the situation is.<br>2. Write what the unknown is.<br>3. Choose a letter for the unknown.<br>4. Write an equation, and solve for the unknown. |
| 6. Guess and Check | • The problem gives a total amount.<br>• The question asks for the kind and number of items in the total. | 1. Find the total amount.<br>2. Find the different items that make up the total.<br>3. Make a reasonable guess about the kind and number of items; then check it. Continue guessing and checking until the guess is correct. |

The first page of each lesson shows you when and how to use a strategy to solve a word problem. You will study an example problem that has been solved using the strategy. You will follow this model as you complete the lesson. In the last part of the book, you will use the six strategies to solve word problems on your own. A glossary is provided on page 36.

# Modeled Practice

## Strategy One: Draw a Diagram

STUDY IT!

Study how Alayna used the strategy DRAW A DIAGRAM to solve the model word problem. She used this strategy because the problem gives information that can be shown in a diagram. Read why Alayna chose DRAW A DIAGRAM and how she found and checked her solution.

### PREVIEW and READ

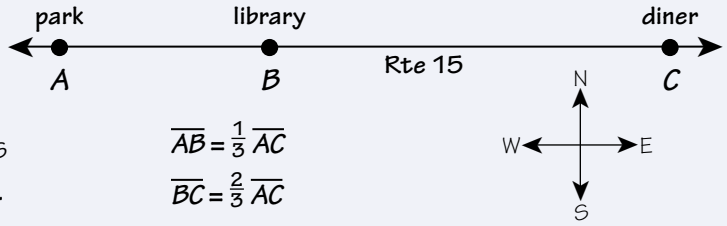
**Model Word Problem**

Route 15 follows a straight line from west to east. In order, from west to east is a park, a library, and a diner. From the park to the library is $\frac{1}{3}$ of the distance from the park to the diner. From the library to the diner is $\frac{2}{3}$ of the distance from the park to the diner. What is the ratio of the distance from the library to the diner to the distance from the park to the library?

**Explain Why:** I chose DRAW A DIAGRAM because the problem gives information that I can draw and label. The question asks for the ratio of the distances of 3 places located on a west-east road. I can use the information in the diagram to find the answer.

### PLAN and SOLVE

1. Find the information needed for the diagram: order from west to east: park, library, diner; park to library = $\frac{1}{3}$ distance from park to diner; library to diner = $\frac{2}{3}$ distance from park to diner
2. Draw and label the diagram:
3. Use the diagram to answer the question: Use the fractions and distances to find the ratio.




$\overline{AB} = \frac{1}{3}\ \overline{AC}$

$\overline{BC} = \frac{2}{3}\ \overline{AC}$

**Explain How:** I wrote the information needed for the diagram. I drew a horizontal line for the west-east road. I then labeled the places in the order given (park, library, diner). Next, I labeled each place with a point and letter: *A, B, C.* I used the fractions given and the line segments to compare the distances. Then I wrote a ratio of $\overline{BC}$ to $\overline{AB}$: $\frac{2}{3}$ to $\frac{1}{3}$, or 2 to 1.

**Solution:** The ratio of the distance from the library to the diner to the distance from the park to the library is 2 to 1.

### CHECK and REVIEW

I checked my solution by assigning a number at random (9 miles) for the distance from the park to the diner. The distance from the park to the library is $\frac{1}{3}$ of 9 miles (3 miles), and the distance from the library to the diner is $\frac{2}{3}$ of 9 miles (6 miles). The ratio of 6 to 3 is equal to 2 to 1.

TRY IT!

Read the practice word problem. Explain why DRAW A DIAGRAM can be used to solve the problem. Then solve the problem. Check your solution.

## PREVIEW and READ

**Practice Word Problem**

There are 8 teams in the playoff round of a soccer league. Once a team loses 1 game, it is out of the playoffs. The winning team of each game advances to the next round to play the winning team of a different game. How many games must be played to determine the champion team?

**Explain Why:** _____

_____

_____

## PLAN and SOLVE

**Explain How:** _____

_____

_____

_____

**Solution:** _____

## CHECK and REVIEW

_____

_____

_____

HINTS

The problem gives information that can be shown in a diagram.

The question asks for a solution that can be found by using the diagram.

1. Find the information needed for the diagram.
2. Draw and label the diagram with information from the problem.
3. Use the diagram to answer the question.

Check your solution by solving the problem another way.

# Guided Practice

## Strategy One: Draw a Diagram

**TRY IT!**

Use the strategy DRAW A DIAGRAM to solve the word problem.
Show your work. Then check your solution.

**REMEMBER**

1. Find the information needed for the diagram.
2. Draw and label the diagram with information from the problem.
3. Use the diagram to answer the question.

### PREVIEW and READ

For an art project, Madlyn is using a compass to construct circles on a piece of posterboard. The circles must have a radius of $2\frac{1}{2}$ inches. How many circles can Madlyn draw on a piece of posterboard that measures 11 inches by 17 inches?

### PLAN and SOLVE

**Explain How:** _____

_____

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_____

_____

**Solution:** _____

_____

### CHECK and REVIEW

_____

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_____

# Independent Practice

## Strategy One: Draw a Diagram

TRY IT!

Use the strategy DRAW A DIAGRAM to solve each word problem.
Show your work. Then check your solution.

**1.**

In a rectangular 10,000-square-mile region, Ashland is located in the south, midway between east and west. Braydon is located to the northeast of Ashland. Camden is directly north of Braydon. Dayton is located directly west of Camden and to the northwest of Ashland. Ellis is northwest of Ashland and southeast of Dayton. In what direction is Braydon from Dayton?

**Solution:** _____

**2.**

Kori is buying a new window. The window is rectangular, with a semicircle on top of the rectangle. The vertical length of the rectangle is 48 inches. The horizontal width of the window is 32 inches. What is the area of the window? (Area of a circle: $A = \pi r^2$)

**Solution:** _____