LESSON 6-3 Ready to Go On? Problem Solving Intervention
Finding Percents

Organizing information can help you solve many problems.
Scott consumes 2500 calories per day, and 28% of the calories come from fat. Mandy consumes 2000 calories per day. If Mandy eats the same number of fat calories as Scott, what percent of her calories will come from fat?

Understand the Problem

1. Complete the table to organize what you know. Use *x* for the number you need to find.

Name	Daily Calories	Percent from Fat
Scott	2500	28%
Mandy	2000	*x* %

Make a Plan

2. If you knew how many fat calories Mandy consumes per day, how could you find *x*?

Find what percent that is of 2000.

3. If you knew how many fat calories Scott consumes per day, how could you tell how many Mandy consumes per day?

It is the same.

4. How can you find the number of fat calories Scott consumes per day?

Find 28% of 2500.

Solve

5. Complete to find out how many fat calories Scott consumes per day.

28 % of 2500 = 0.28 • 2500 = 700

6. If Mandy ate the same number of fat calories as Scott, what percent of her daily calories would that be? Complete and solve for *x* to find out.

700 is *x* % of 2000 → $\frac{x}{100} = \frac{700}{2000}$ → $x = \frac{700 \cdot 100}{2000} =$ 35%

Check

7. Is Mandy's percent greater than Scott's? Why does that make sense?

Yes; The part (number of fat calories) is the same, but the whole is less.

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LESSON 6-4 Ready to Go On? Skills Intervention
Finding a Number When the Percent Is Known

A known percent can be used to find a missing number when solving problems.

Finding a Number When the Percent is Known

A. 56 is 40% of what number?
Write an equation to solve the problem.

The word "is" tells you to use the equals sign and "of" tells you to multiply.
Remember to use the decimal equivalent of 40%. 40% = 0.40

56 = 0.40 • *n*	Write the equation.
$\frac{56}{0.40} = \frac{0.40n}{0.40}$	Divide both sides by 0.40 to isolate the variable.
140 = *n*	Solve for *n*.

56 is 40% of 140.

B. 12 is 60% of what number?

Think: 60 is to 100 as 12 is to what number?

$\frac{60}{100} = \frac{12}{n}$	Set up a proportion to solve the problem.
60 • *n* = 100 • 12	Find the cross products.
60*n* = 1200	Simplify and solve the equation.
$\frac{60n}{60} = \frac{1200}{60}$	Divide both sides by 60 to isolate *n*.
n = 20	

12 is 60% of 20.

Technology Application

A CD-ROM has a storage capacity of 673 Mega-bytes (MB). This is 269% of the storage capacity of a Zip® disk. To the nearest Mega-byte, find the storage capacity of a Zip® disk.

Think: 673 is 269% of what number?

What does "is" represent? equal sign Write 269% as a decimal. 2.69

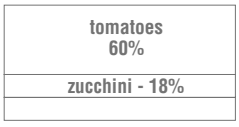
673 = 2.69 • *n*	Set up the equation.
$\frac{673}{2.69} = \frac{2.69n}{2.69}$	Isolate *n*.
250.19 = *n*	Divide.

The storage capacity of a Zip® disk is 250 mega-bytes.

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LESSON 6-4 Ready to Go On? Problem Solving Intervention
Finding a Number When the Percent is Known

In a garden, the tomato section is 20 ft by 6 ft and takes up 60% of the total area. The zucchini section takes up 18% of the area. How many square feet is the zucchini section?



Understand the Problem

1. Make a sketch to show what you know.

Make a Plan

2. If you knew *G*, the area of the whole garden, how could you find *Z*, the area of the zucchini section?

Find 18% of *G*.

3. Suppose you knew *T*, the area of the tomato section. Write a percent statement you could use to find *G* (the area of the garden).

Sample answer: *T* = 60% of *G*

4. How can you calculate *T*?

Multiply 20 • 6.

Solve

5. Find *T*, the area of the tomato section. *T* = 120

6. Find G, the area of the garden.

$T = 0.6G,\ 120 = 0.6G,\ G = \frac{120}{0.6} = 200$

7. Now find *Z* and then answer the question in the problem.

Z = 18% of *G*, *Z* = 0.18(200) = 36, *Z* takes up 36 square feet.

Check

8. Compare your answers with the sketch from Exercise 1. Are your numbers reasonable?

If not, students should decide if the error is in the sketch or the solution.

Solve

9. A 15 ft by 5 ft section of roses makes up 30% of a flower garden. What is the area of the tulip section that takes up 16% of the garden?

40 square feet

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SECTION 6A Ready to Go On? Quiz

6-1 Relating Decimals, Fractions, and Percents

Compare. Write <, >, or =.

1. $\frac{5}{9}$ < 56% **2.** 0.86 > $\frac{6}{7}$ **3.** 8% = 0.08

4. $\frac{3}{7}$ < 0.43 **5.** 2.3 > 23% **6.** 37% < $\frac{3}{8}$

Order the numbers from least to greatest.

7. $\frac{7}{8}$, 0.9, $\frac{6}{7}$, 85%
85%, $\frac{6}{7}$, $\frac{7}{8}$, 0.9

8. $\frac{3}{14}$, 9.9%, 0.16, $\frac{1}{6}$
9.9%, 0.16, $\frac{1}{6}$, $\frac{3}{14}$

9. 30%, $\frac{2}{5}$, 7.4%, 0.297
7.4%, 0.297, 30%, $\frac{2}{5}$

10. 0.011, $\frac{1}{11}$, 0.1, 6%
0.011, 6%, $\frac{1}{11}$, 0.1

11. Exactly 60% of the animals in the local animal shelter are dogs. What fraction of the animals is this? $\frac{3}{5}$

6-2 Estimating with Percents

Estimate.

12. 67% of 87 60 **13.** 15% of 79 12 **14.** 55% of 81 44

15. 17% of 54 9 **16.** 40% of 42 16 **17.** 5% of 115 6

Estimate the tip for each bill.

15. 12% on a $16.15 bill $2 **16.** 15% on a $33.90 bill $5 **17.** 10% on a $28.98 bill $3

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SECTION 6A

Ready to Go On? Quiz continued

6-2 Estimating with Percents (continued)

18. About 21.1% of the riders pay half-fare on the local bus system. Douglas estimates that if 124,800 people ride the buses in a day, about 10,000 of them will pay half-fare. Estimate to determine whether Douglas' number is reasonable. Explain.

no; 20% of 125,000 is 25,000, which is more than double Douglas' number.

6-3 Finding Percents

19. What is 44% of 4? 1.76

20. What is 85% of 6? 5.1

22. What is 11% of 11? 1.21

23. What is 52% of 5? 2.6

24. What is 34% of 7? 2.38

25. What is 15% of 13? 1.95

26. An estimated 293.6 million people were Americans in 2004. An estimated 41.3 million of these Americans were Hispanic or Latino. To the nearest tenth of a percent, what percent of the American population was Hispanic or Latino in 2004?

14.1%

27. Minnesota is called the Land of 10,000 Lakes. The total surface area of the state is about 86,940 square miles. The water area is approximately 7,330 square miles. To the nearest tenth of a percent, what percent of Minnesota is water?

8.4%

6-4 Finding a Number When the Percent is Known

30. 18 is 22.5% of what number? 80

31. 77 is 55% of what number? 140

32. 161 is 230% of what number? 70

33. 5 is 4% of what number? 125

34. The normal highway speed limit of 65 mph is only about 34.95% of the highest speed ever achieved for an entire 500-mile race at the Indianapolis 500. To the nearest hundredth of a mile per hour, what would this record speed be?

185.98 mph

35. A highway speed limit is only 55 mph. However, this is 240% of the speed of a bicycle that is traveling along the side of the road. To the nearest tenth of a mile per hour, how fast is the bicycle moving?

22.9 mph

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SECTION 6A

Ready to Go On? Enrichment

Cross-Percents

These puzzles are worked the same way as crossword puzzles. Solve the problems in the clues and write the answers in the boxes across and down, one digit only per box. Round to whatever place is necessary to make the answer fit.

If there is a decimal point in the answer, put it in the box with the digit that follows it, with the decimal point preceding the digit. A decimal point, just like a digit, must always be valid for both the across answer and the down answer. Decimals less than 1, contrary to the customary convention, should be written without a zero in the ones place.

Puzzle I

1 1	2 2				
3 3	1	4 5			
		5 1	.0	6 5	
				7 8	1

ACROSS

1. 8% of 150
3. 420% of 75
5. 7% of 15
7. 131% of 62

DOWN

1. 22% of 60
2. 32% of 66
4. 330% of 15.4
6. 6.3% of 927

Puzzle II

		1 1	2 8
	3 1	0	8
4 5	4	.7	
5 2	3		
	6 .7	7 1	8 5
	9 5	6	1

ACROSS

1. 72% of 25
3. 216% of 50
4. 57% of 96
5. 27% of 85
6. 0.5% of 143
9. 850% of 66

DOWN

1. 89% of 12
2. 116% of 76
3. 25% of 575
4. 7% of 743
7. 19% of 84
8. 119% of 43

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LESSON 6-5

Ready to Go On? Skills Intervention

Percent Increase and Decrease

Percent change is the ratio of change to the original amount.
Percent increase represents an increase in the original amount.
Percent decrease represents a decrease in the original amount.

Vocabulary
percent change
percent increase
percent decrease

Finding Percent Increase or Decrease
Find the percent increase or decrease from 65 to 50, to the nearest percent.

The number gets smaller, so this is a percent decrease.

65 − 50 = 15 Find the amount of change of the two numbers.

15 = p • 65 Write an equation. *Think: 15 is what percent of 65?*

$\frac{15}{65} = \frac{p \cdot 65}{65}$ Solve for p by dividing both sides by 65.

0.23 = p Solve for p.

What is the percent equivalent of your answer? 23%

So, from 65 to 50 there is a 23 % decrease.

School Application

Javier scored a 72 and then an 85 on his last two math tests. What is the percent increase in his scores?

85 − 72 = 13 Find the amount of change between the two scores.

13 = p • 72 Write an equation. *Think: 13 is what percent of 72?*

$\frac{13}{72} = \frac{p \cdot 72}{72}$ Solve for p by dividing both sides by 72.

0.18 = p Solve for p.

How do you change a decimal to a percent? Multiply by 100 and add a percent sign or move the decimal 2 places to the right and add the percent sign.

Write 0.18 as a percent. 18%

Javier had an 18 % increase in his test scores.

Using Percent Increase or Decrease to Find Prices
Kaylee buys a CD collection priced at $60. She received a 15% discount. How much did Kaylee pay for her CDs?

Kaylee received a discount so this is an example of a percent decrease.

d = 0.15 • 60 = 9 Find 15% of the original price to determine the discount.

60 — 9 = 51 Subtract the discount from the original price.

Kaylee paid $51 for the CD collection.

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LESSON 6-5

Ready to Go On? Problem Solving Intervention

Percent Increase and Decrease

A store owner changes the regular price of a camera by 50% each day. She raises the price 50% the first day, lowers it 50% the second day, then raises it 50% the third day, and so on. When will the price of the camera be less than half its regular price?

Understand the Problem

1. What happens to the price on the first day? On the second day?

It increases by 50%. It decreases by 50%.

2. Does the problem ask for when the price will reach a certain dollar amount? What does it ask for?

No; When the price will be less than $\frac{1}{2}$ the regular price.

Make a Plan

3. Choose an amount for the regular price. Why does it make sense to pick an amount like $100 rather than an amount like $67.98?

It's much easier to work with.

4. If the regular price is $100, what will the price be on the first day? Explain.

$150; 100 + 50% of 100 = 150

5. When you compute the price on the second day, what amount will you take 50% of to find the discount? Why?

$150; That is the price at that time.

Solve

6. Fill in the table and then extend it to solve the problem.

7. When will the price fall below half the regular price?

	1st	2nd	3rd	4th	5th	6th
Starting Price	100.00	150.00	75.00	112.50	56.25	84.37
Change in Price	+50.00	−75.00	+37.50	−56.25	+28.12	−42.18
New Price	150.00	75.00	112.50	56.25	84.37	42.19

on the sixth day

Check

8. Try a different starting price and see if you get the same answer.

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SECTION 6B Ready to Go On? Quiz

6-5 Percent Increase and Decrease

Find each percent increase or decrease to the nearest percent.

1. from 30 to 41 **37% increase**
2. from 90 to 73 **19% decrease**
3. 125 to 59 **53% decrease**
4. from 87 to 100 **15% increase**
5. Playing on the school baseball team, Jake got 46 hits last year and only 37 hits this year. What is the percent decrease to the nearest tenth of a percent? **19.6%**
6. Suppose gasoline cost $2.89 per gallon six months ago and it costs $3.19 per gallon now. What would the percent increase be to the nearest tenth of a percent? **10.4%**
7. A pair of jeans that costs $89.59 is on sale for 25% off. What is the sale price of the jeans? **$67.19**

6-6 Applications of Percents

Find the commission or sales tax to the nearest cent.

8. total sales: $16,000.00
   commission rate: 5.5% **$880.00**
9. total sales: $9,500.00
   commission rate: 3.75% **$356.25**
10. total sales: $117.89
    sales-tax rate: 7.5% **$8.84**
11. total sales: $22.50
    sales-tax rate: 9.25% **$2.08**
12. total sales: $359.01
    commission rate: 6% **$21.54**
13. total sales: $3599.50
    sales-tax rate: 4.5% **$161.98**
14. Jonvil sold $4,400 worth of clothing last month and received a commission of $341. What was her commission rate? **7.75%**

6-7 Simple Interest

Find the interest and the total amount, both to the nearest cent.

15. $1,450 at 6% for 2 years
    interest: **$174.00**
    total amount: **$1,624.00**
16. $899 at 4% for 5 years
    interest: **$179.80**
    total amount: **$1,078.80**

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SECTION 6B Ready to Go On? Quiz continued

6-7 Simple Interest

21. $71 at 2.5% for 10 years
    interest: **$17.75**
    total amount: **$88.75**
22. $21,600 at 9% for 12 years
    interest: **$23,328.00**
    total amount: **$44,928.00**
23. $520 at 3.55% for 4 years
    interest: **$73.84**
    total amount: **$593.84**
24. $2,130 at 7% for 6.5 years
    interest: **$969.15**
    total amount: **$3,099.15**
25. Wilma puts $315 into a savings account at her neighborhood bank. The interest rate is fixed at 4.5%. After 2 years, how much interest will Wilma have earned? What will the total amount in her account be?
    interest: $28.35; total amount: $343.35
26. Jordon borrows $88 at 12.5% annual interest. She pays off her debt after six months. What was the amount of her interest? What was the total amount she had to pay back?
    interest: $5.50; total amount: $93.50
27. Abdul borrows $10,500 for 5 years to buy a car. The annual interest rate is 8.25%. What is the interest that he must pay? What is the total amount he has to pay back?
    interest: $4,331.25; total amount: $14,831.25
28. Gigi loans someone $225 at 5.4% annual interest for four months. What interest will she earn? How much money will she be paid back in all?
    interest: $4.05; total amount: $229.05
29. The Happy Hammer Lumber Company borrowed $120,000 at 3.5% annual interest for 2.5 years. What interest did they have to pay? What was the total amount they had to pay back?
    interest: $10,500.00; total amount: $130,500

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SECTION 6B Ready to Go On? Enrichment

From Start to Finish

Part I

Begin at **START**. Your goal is to reach **FINISH**. Each turn, find the percent increase (+) or decrease (−), using the two numbers in the square where you are located. Find the correct answer to the nearest percent one square up, down, left, or right (never diagonally) from where you are. Draw a line from your old square to the new square, which is now where you will be located. Continue until you reach **FINISH**. Always mark your path as you progress. You may use a calculator.

START	**+ 48%**	**− 83%**	**− 23%**	**+ 71%**
from 70 to 103	from 115 to 19	from 75 to 58	from 29 to 99	from 84 to 65
+ 47%	**− 55%**	**− 5%**	**+ 241%**	**+ 5%**
from 65 to 29	from 44 to 65	from 77 to 62	from 37 to 39	from 470 to 62
+ 55%	**+ 5%**	**− 19%**	**+ 111%**	**− 87%**
from 6 to 0	from 19 to 123	from 41 to 43	from 97 to 79	from 150 to 317
− 100%	**+ 547%**	**− 99%**	**− 18%**	**+ 211%**
from 200 to 166	from 258 to 3	from 18 to 19	from 31 to 259	from 64 to 11
− 17%	**− 97%**	**+ 6%**	**+ 735%**	**− 83%**
from 1,440 to 0	from 320 to 266	from 99 to 827	from 350 to 60	**FINISH**

Part II

Now let's do a check on your work. Identify all the squares your path did not touch. Add the positive percents located at the top of these squares and subtract the negative ones. The result will be 100% if all your work is correct, and you will have solved the puzzle.

71% − 5% + 55% − 100% − 18% + 211% − 17% − 97% = 100%

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LESSON 7-1 Ready to Go On? Skills Intervention

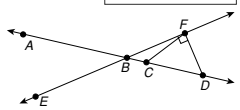
Points, Lines, Planes, and Angles

The building blocks of geometry are the **point, line,** and **plane.**

A **right angle** measures 90°, an **obtuse angle** measures greater than 90° but less than 180°, and an **acute angle** measures less than 90°. Two acute angles are said to be **complementary** if their measures add to 90°.

Vocabulary
point
line
plane
right angle
obtuse angle
acute angle
complementary angles

Use the figure to the right to answer each question.



Naming Points, Lines, and Planes

A. Name five points in the figure.
How many letters name a point? **1**
Name 3 points. **Possible answers: Points *A*, *B*, *C*, *D*, *E*, or *F***

B. Name a line in the figure.
How many points name a line? **at least 2**
Name a line in the figure. **Possible answers: $\overleftrightarrow{AD}$ or $\overleftrightarrow{AB}$ or $\overleftrightarrow{EF}$**

C. Name a plane in the figure.
How many points name a plane? **at least 3**
What figure do three points in a plane form? **triangle**
Name a plane. **Possible answers: plane *CDF* or plane *BDF***

Classifying Angles

A. Name a right angle in the figure.
How many degrees are in a right angle? **90°**
Name a right angle. **∠*BFD***

B. Name two acute angles in the figure.
What is the measure of an acute angle? **less than 90°**
Name two acute angles. **∠*ABE*, ∠*CFD***

C. Name two obtuse angles in the figure.
An obtuse angle has a measure greater than **90°** but less than **180°**.
Name two obtuse angles. **∠*EBD*, ∠*ABF***

D. Name a pair of complementary angles in the figure.
The sum of the measures of complementary angles total **90°**.
Name two complementary angles. **∠*BFC*, ∠*CFD***

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