Key to Percents®

PERCENT CONCEPTS

1
Student Workbook

By Steven Rasmussen and David Rasmussen

Name

Class
### TABLE OF CONTENTS

- Percent Hunt ................................................................. 1
- All and None as Percents .................................................. 6
- One Half and One Fourth as Percents ................................ 8
- 100% Makes it All ............................................................. 11
- Floor Plans ................................................................. 13
- Recommended Daily Allowances (RDA) of Vitamins ............. 14
- Double and Triple as Percents .......................................... 15
- Practice with Percents ..................................................... 17
- One Tenth as a Percent ..................................................... 21
- One Hundredth as a Percent ............................................ 23
- Practice with 1% and 10% ................................................ 25
- Other Percents .............................................................. 29
- Finding a Percent of a Number ......................................... 33
- Estimating Percents ........................................................ 39
- Percent Is Based on 100 ..................................................... 42
- Practice Test ................................................................. 44

---

**About the Cover:**

Percent is a mathematical concept that has been used since the end of the fifteenth century in business problems such as computing interest, profits and losses, and taxes. However, the idea had its origin much earlier. When the Roman emperor, Caesar Augustus, levied a tax on all goods sold at auction, centesima rerum venalium, the rate was 1/100 of the value. Other Roman taxes were 1/20 on the value of every freed slave and 1/25 on the price of every slave sold. Without recognizing percentages as such, the Romans used fractions easily converted to hundredths.

Just as in Roman times, many of the taxes we pay today are based on percents. Sales taxes are based on a percent of the sales price of items we buy. We pay a percent of our incomes as income tax. Property taxes are based on a percent of a property's value.

---

**IMPORTANT NOTICE:** This book is sold as a student workbook and is not to be used as a duplicating master. No part of this book may be reproduced in any form without the prior written permission of the publisher. Copyright infringement is a violation of Federal Law.
Percent Hunt

Percent are used in many places. They’re used in newspaper ads, food and medicine labels, weather reports, and on tax forms. Sometimes a percent is written using the word "percent," and sometimes it is written using "%," the symbol for percent. This symbol is called the percent sign.

Find and circle each percent below.

110% Price Guarantee
Buy from Uncle Ralph’s, and if your purchase is subsequently advertised locally for less, even by us, bring us the ad within 20 days of purchase. We will send you the difference plus 10% of the difference for your trouble.

RUGGED WEAR LTD.
HARRAGANETT, R.I.
100% COTTON - COLD WATER WASH
NO BLEACH - HANDS TO BE
MADE IN U.S.A.

TV’s numbers game
FOR A decade or so, KGO, KPIX and KRON have been losing prime-time viewers to cable TV’s independent stations and videocassette recording part of a national trend known as “audience erosion.” But the erosion may be ending in the Bay Area — and that’s good news for San Francisco’s three network TV affiliates.

A.C. Nielsen Co. said the three stations captured an average of 68 percent of the viewing audience during prime-time hours (6-11 p.m. Monday through Saturday and 7-11 p.m. Sunday) during the important February ratings period. The figure was identical to that recorded by Nielsen a year ago.

Arbitron Ratings Service showed a slight drop, from 69 percent to 67 percent during the year, a difference that may be statistically insignificant.

It’s good news to the affiliates, of course, because it means the audience is holding steady — and the more people in front of the set, the more advertisers.

1450 PETS, SUPPLIES & SERVICES

The Final Four semifinal game telecasts were a hit with the viewers. The first game (Grosseto-Pryor) registered a 10.7 rating, 22 percent better than last year’s Louisville-LSU game. The nightcap (Indiana-UNLV) got a 13.8 rating, up 19 percent over last year’s Duke-Kansas telecast.
Percent Means Hundredths

A fraction with a denominator of 100 is easy to write as a percent. Just write down the numerator of the fraction and follow it with a percent sign. The percent sign means hundredths. (It even looks like a "1" and two "0"s.)

\[
\frac{25}{100} = 25\% \quad \text{"25 hundredths = 25 percent"}
\]

What part of each large square is shaded? Give each answer as a fraction with denominator 100 and also as a number with a percent sign.
What part of each group is circled? Give each answer as a fraction with denominator 100 and as a number with a percent sign.

<table>
<thead>
<tr>
<th>Fraction:</th>
<th>Percent:</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/4</td>
<td>75%</td>
</tr>
<tr>
<td>2/5</td>
<td>40%</td>
</tr>
<tr>
<td>1/8</td>
<td>12.5%</td>
</tr>
<tr>
<td>3/10</td>
<td>30%</td>
</tr>
<tr>
<td>5/8</td>
<td>62.5%</td>
</tr>
</tbody>
</table>

- Write each answer in two ways.

Munch bought a box of Fritz crackers. Just before lunch he ate 85 of the 100 crackers in the box. What percent of the crackers did Munch eat?

Fraction: \( \frac{85}{100} \)  Percent: 85%

Aran took a math test that had 100 problems. He got 100 problems correct. What percent of the problems did Aran get correct?

Fraction: \( \frac{100}{100} \)  Percent: 100%

Anton's teacher gave her class 100 minutes for a math test. Anton took 95 minutes to complete the test. What percent of the time did Anton use?

Fraction: \( \frac{95}{100} \)  Percent: 95%

Monica is a quality inspector for a supermarket. She checked a sample of 100 oranges for spoilage. None were spoiled. What percent were spoiled?

Fraction: \( \frac{0}{100} \)  Percent: 0%
The word percent comes from the Latin word "centum" which means one hundred. So does the word "cent." A cent is one hundredth of a dollar. Percent means "out of every 100" or "compared to 100" or "per hundred."

\[
\text{50\% means \{} \begin{align*}
50 \text{ out of every 100} \\
50 \text{ compared to 100} \\
50 \text{ per hundred.}
\end{align*}\]

Complete each sentence. Use "out of every 100" or "compared to 100" or "per hundred" and a fraction with 100 as denominator.

<table>
<thead>
<tr>
<th>12% means: \text{12 out of every 100}</th>
<th>or \frac{12}{100}</th>
</tr>
</thead>
<tbody>
<tr>
<td>1% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
<tr>
<td>18% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
<tr>
<td>6% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
<tr>
<td>50% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
<tr>
<td>98% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
<tr>
<td>100% means: \underline{}</td>
<td>or \underline{}</td>
</tr>
</tbody>
</table>

Write each percent in three ways.

<table>
<thead>
<tr>
<th>Using words</th>
<th>As a fraction with denominator 100</th>
<th>As a number with a percent sign</th>
</tr>
</thead>
<tbody>
<tr>
<td>36 out of every 100</td>
<td>\frac{36}{100}</td>
<td>36%</td>
</tr>
<tr>
<td>48 out of every 100</td>
<td>\frac{48}{100}</td>
<td>3%</td>
</tr>
<tr>
<td>99 compared to 100</td>
<td>\frac{7}{100}</td>
<td>100%</td>
</tr>
</tbody>
</table>
Each large square below is divided into _______ small equal squares.

- Shade 25%.
- Shade 50%.
- Shade 75%.
- Shade 100%.
- Shade 1%.
- Shade 10%.
- Shade 11%.
- Shade 99%.

Each group of stars below has _______ stars.

<table>
<thead>
<tr>
<th>Circle 15%</th>
<th>Circle 60%</th>
<th>Circle 95%</th>
</tr>
</thead>
<tbody>
<tr>
<td>************</td>
<td>************</td>
<td>************</td>
</tr>
<tr>
<td>************</td>
<td>************</td>
<td>************</td>
</tr>
<tr>
<td>************</td>
<td>************</td>
<td>************</td>
</tr>
<tr>
<td>************</td>
<td>************</td>
<td>************</td>
</tr>
</tbody>
</table>

Each rectangle below is divided into _______ equal parts.

- Shade 33%.
- Shade 90%.
- Shade 0%

___% is not shaded.  ___% is not shaded.  ___% is not shaded.

Answer each question using a complete sentence.

90% of the songs played on Station KRAZ are rock and roll. Yesterday afternoon the DJ played 100 songs. How many were rock and roll?

___ songs were rock and roll.

Sui bought a sheet of 100 postage stamps. She used 82% of them to mail greeting cards. How many stamps did she have left?

___% is not shaded.
- All and None as Percents

Shade all of the square.

What percent of the square is shaded? _____%

All of something is _____% of it.

1 = _____%

Shade none of the square.

What percent of the square is shaded? _____%

None of something is _____% of it.

0 = _____%

Circle all of the stars. Shade 100%.

Circle 100% of the dots.

Circle none of the stars. Shade 0%.

Circle 0% of the dots.

Answer each question using a complete sentence.

On the day of the Mr. Mean's class picnic, everyone came to school. What percent of the class was present?

_____% of the class was present.

On the next day Mr. Mean gave a math test. No one showed up. What percent of the class was present?

_____% of the class was present.
You can use 100% and 0% even when you can’t divide something into hundredths. 0% of any number is zero (none of it). 100% of any number is the number (all of it).

Shade 100%.

Circle 0%.

Shade 0%.

Circle 100%.

Shade 100%.

Circle 0%.

0% of 8 is ___.
100% of 8 is ___.

0% of 25 is ____.
100% of 25 is ____.

0% of 99 is ____.
100% of 99 is ____.

_____ is 100% of 12.

0% of 32 is ____.

_____ is 0% of 64.

0 is _____% of 16.

84 is ____% of 84.

_____% of 1320 is 1320.

35 is 100% of ____.

0 is 100% of ____.

0 is 0% of ____.

Use 0% and 100% with amounts of money just as you did with numbers.

0% of $50 is $0.

100% of $18.50 is ____.

100% of $100 is ____.

_____ is 0% of $5.

100% of $1 is ____.

_____ is 100% of 25¢.

Answer each question using a complete sentence.

Bill had 30 minutes to complete his math test. He used 100% of his time. How long did he spend on his test?

He spent ____ minutes on his test.

The Stingy Pay Plant workers earn $6.50 per hour. The owner offered them a 0% raise. How much per hour was the raise?
One Half and One Fourth as Percents

Shade one half of the square.

What percent of the square is shaded? ____%

One half of something is ____% of it.

\[
\frac{1}{2} = ____\%
\]

Put hair on half the heads.
Put ears on 50% of the heads.

Circle 50% of the dollar.

Put X's in 50% of the squares.
Shade 50% of the squares.

Shade 50% of the shapes.

Circle half of the stars.

Shade about 50% of the circle.

---

How many squares? 12
Shade 50%.
How many shaded? 6
50% of 12 is 6.

How many squares? ____
Shade 50%.
How many shaded? ____
50% of ____ is ____.

How many flowers? ____
Circle 50%.
How many circled? ____
\[\frac{1}{2}\] of ____ is ____.
50% of ____ is ____.

How many bulbs? ____
Circle 50%.
How many circled? ____
\[\frac{1}{2}\] of ____ is ____.
50% of ____ is ____.
Shade one fourth of the square.

What percent of the square is shaded? _____%

One fourth of something is _____% of it. \( \frac{1}{4} = _____\% \)

Put hair on 25% of the heads. Put ears on 100% of the heads.
Circle 25% of the stars. Shade about 25% of the circle.

<table>
<thead>
<tr>
<th>How many squares?</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shade 25%.</td>
<td></td>
</tr>
<tr>
<td>How many shaded?</td>
<td></td>
</tr>
<tr>
<td>25% of _____ is __</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How many squares?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shade 25%.</td>
<td></td>
</tr>
<tr>
<td>How many shaded?</td>
<td></td>
</tr>
<tr>
<td>25% of _____ is __</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How many stars?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Circle 25%.</td>
<td></td>
</tr>
<tr>
<td>How many circled?</td>
<td></td>
</tr>
<tr>
<td>( \frac{1}{4} ) of _____ is __</td>
<td></td>
</tr>
<tr>
<td>25% of _____ is __</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>How many circles?</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Shade 25%.</td>
<td></td>
</tr>
<tr>
<td>How many shaded?</td>
<td></td>
</tr>
<tr>
<td>( \frac{1}{4} ) of _____ is __</td>
<td></td>
</tr>
<tr>
<td>25% of _____ is __</td>
<td></td>
</tr>
</tbody>
</table>

Try these without pictures to help.

\( \frac{1}{2} \) of 28 is \( 14 \). 50% of 28 is \( 14 \). \( \frac{1}{4} \) of 28 is __. 25% of 28 is __.

\( \frac{1}{3} \) of 36 is __. \( \_\_\_\_\_\_\_\_\_\_% \) of 36 is 18. \( \frac{1}{4} \) of 36 is __. \( \_\_\_\_\_\_\_\_\_\_% \) of 36 is 9.
Since 50% = $\frac{1}{2}$ and 25% = $\frac{1}{4}$, there is an easy way to find 50% and 25% of a number.

**To find 50% of a number, simply divide by 2.**
**To find 25% of a number, simply divide by 4.**

Use division to fill in the chart below.

<table>
<thead>
<tr>
<th>100%</th>
<th>32</th>
<th>80</th>
<th>200</th>
<th>24¢</th>
<th>$1.80</th>
<th>$12.40</th>
<th>$104</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>8</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use division to solve each problem below.

50% of 40 is ____.  
50% of $44 is ____.  
50% of $9.00 is ____.

25% of 40 is _____.  
25% of $44 is _____.  
25% of $9.00 is ____.

6 is 50% of ____.  
_____ is 25% of 48.  
_____ is 25% of $20.

6 is ____% of 12.  
12 is ____% of 48.  
$5 is ____% of $20.

_____ is 50% of 12.  
12 is 25% of _____.  
$5 is 25% of ____.

9 is ____% of 18.  
_____ is 50% of 30.  
3 is 50% of ____.

2 is ____% of 8.  
_____ is 25% of 36.  
10 is 50% of ____.

$1 is ____% of $2.  
_____ is 25% of $64.  
$7 is 25% of ____.

Be careful on the ones below! They're trickier.

$1.50 is ____% of $3.  
_____ is 25% of $8.00.  
$3.50 is 25% of ____.

$14.25 is 50% of _____.  
_____ is 25% of $5.00.  
_____ is 25% of $42.00.
100% Makes it All

Fill in each missing percent. Remember, all of something is ____% of it.

A pie chart is one useful way to show information. A pie chart is made with a circle divided into slices of "pie." The complete circle is 100%.

Fill in the missing percent in each pie chart below. Then use the pie chart to help answer the question.

**Students at Cabot High School**

- Boys: 46%
- Girls: 54%

What percent of the students at Cabot High are girls?

**Favorite Pet of 7th Graders**

- Cat: 37%
- No pet: 33%
- Bird: 18%
- Other: 8%
- Dog: 16%

What percent of the seventh graders chose no pet?

**Motor Vehicles at the Stadium Lot**

- Cars: 35%
- Trucks: 12%
- Motorcycles: 32%
- Trains: 18%

Trucks and cars make up what percent of the vehicles?

**Math Test Results**

- A: 13%
- B: 17%
- C: 26%
- D: 26%
- F: 12%

What percent of the students got higher than a D on the test?
The diagram shows how body weight is divided between the body parts in the average adult in the U.S. Each arm is about the same weight. What percent of a body's weight is in each arm? ___% Arm

The pie chart shows what the average adult in the U.S. is made of. The weight of fat is about equal to the weight of bones. Study the chart and finish it.

---

**Big Sale!**

What percent of the regular price is taken off? _____

10% Real Fruit Juice

What percent of the drink is fruit juice? _____

What percent is not juice? _____

What is it? __________________

---

35% COTTON

What percent of the fabric is cotton? _____

100% Natural

What percent of the food is natural? _____

What percent is not natural? _____

---

A weather forecaster says there is a 20% chance of rain. What is the chance that it will not rain? _____ Would you take an umbrella if you went out? __________________

Marie got 8% of the problems on her math test wrong and she left 6% more undone.

What percent did she get correct? _____
Floor Plans

Ramona Rodriguez is an architect. She has designed 100 square meters of new office space for a high school. Look at her plan. Use it to answer each question below.

The mail room is _____% of the area.
The principal's office takes up _____% of the space.
The secretarial area occupies _____% of the space.
_____% of the office is taken up by the waiting area.

Now it's your turn to be the architect. You have been hired by a school to design a new art studio. The studio will be 100 square meters. Draw walls and label the areas using the guidelines below.

6% of the area is the teacher's office.
6% is a storage room.
21% is a ceramics area.
9% is a kiln room.
The rest is the classroom.
What percent is classroom? _____%

You did so well designing the school building that you've been hired by the principal to plan a new summer cottage for his family. The cottage will be 100 square meters (including the porch). Make a floor plan for the cottage.

22% of the area is living room.
Two bedrooms each occupy 15%.
20% is kitchen.
6% is bathroom.
12% is porch.
The rest is hall and storage area.
What percent is hall and storage? _____%
This label is from a box of breakfast cereal. It tells about the amounts of vitamins and minerals in a one ounce serving of cereal. The amounts are given as percentages of the Recommended Daily Allowance (RDA) of each vitamin and mineral.

The left column gives the percentages in one ounce of cereal alone. The right column gives the percentages in one ounce of cereal with one half cup of milk.

Use the information to complete the tables below.

<table>
<thead>
<tr>
<th>Nutrient</th>
<th>1 ounce serving of cereal</th>
<th>Cereal with half cup milk</th>
<th>Nutrient</th>
<th>1 ounce serving of cereal</th>
<th>Cereal with half cup milk</th>
</tr>
</thead>
<tbody>
<tr>
<td>Protein</td>
<td>4%</td>
<td>10%</td>
<td>Vitamin D</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin A</td>
<td></td>
<td></td>
<td>Zinc</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Thiamine</td>
<td></td>
<td></td>
<td>Copper</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riboflavin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Niacin</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin D</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B6</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Folic Acid</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vitamin B12</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Phosphorus</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Magnesium</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Zinc</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copper</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

What percent of the RDA of protein do you get in $\frac{1}{2}$ cup of milk alone? _____

What percent of the RDA of vitamin D do you get in $\frac{1}{2}$ cup of milk alone? _____

What percent of the RDA of copper do you get in $\frac{1}{2}$ cup of milk alone? _____

What percent of the RDA of protein do you still need after you've eaten one serving of cereal alone? _____

What percent of the RDA of vitamin A do you still need after you've eaten one serving of cereal with milk? _____

How many servings of cereal would you need to eat to get 100% of the RDA of niacin? _____

©1988 by Key Curriculum Project, Inc.  
Do not duplicate without permission.
Double and Triple as Percents

Shade 100% of a square.
Shade another 100% of a square.
All together you shaded ___% of a square.
All together you shaded ___ squares.
Two of something is _____% of it.

Shade 100% of a square.
Shade a second 100% of a square.
Shade a third 100% of a square.
All together you shaded ___% of a square.
All together you shaded ___ squares.
Three of something is _____% of it.

Shade 200% of a triangle.
Shade 300% of a circle.
Shade 400% of a square.

100% of 6 is ____.
200% of 6 is ____.
300% of 6 is ____.
32 is ____% of 16.

100% of 15 is ____.
200% of 15 is ____.
300% of 15 is ____.
50 is ____% of 25.

___ is 200% of 8.
___ is 300% of 8.
___ is 400% of 8.

27 is ____% of 9.
Below is a graph of the average annual precipitation (rain and melted snow) for 10 cities in North America. The actual precipitation is given at the end of each bar in the graph.

Which city has 200% of the precipitation of Phoenix? ____________________

Which city has 300% of the precipitation of Los Angeles? ____________________

Which city has 400% of the precipitation of Albuquerque? ____________________

Which city has 600% of the precipitation of Phoenix? ____________________

Which city has 250% of the precipitation of Albuquerque? ____________________

Which city has about 300% of the precipitation of San Francisco? ____________________

Which city has about 400% of the precipitation of Los Angeles? ____________________

Which city has about 500% of the precipitation of Albuquerque? ____________________

Which city has about 250% of the precipitation of Minneapolis? ____________________

Which city has about 750% of the precipitation of Albuquerque? ____________________
Practice with Percents

- Draw hats on 50% of the heads.
- Put smiles on 100% of the heads.
- Give 25% of the heads ears.
- Paint 0% of the heads blue.

Shade 25% of all the rectangles.
- Put an X inside 50%.
- Make a ring around 100%.

Show how much each person earns per hour.

Sally earns $6.00 per hour. Sally: $5 $1 $6.00

Ted earns 200% of Sally's pay. Ted:

Ora earns 300% of Sally's pay. Ora:

Alisa earns 50% of Sally's pay. Alisa:

Joan earns 200% of Ted's pay. Joan:

How full should each cup be? Shade the cups to show your answer.

Cup A is 25% full.
Cup B has 200% as much as cup A.
Cup C has 50% as much as cup B.
Cup D has 300% as much as cup A.
What percent of the things in each group are circled? What percent are not circled?

![Circled and Not Circled Pictures]

What percent of each square is shaded?

![Shaded Squares]

Answer each question using a complete percent statement.

<table>
<thead>
<tr>
<th>Problem: What is 50% of $24?</th>
<th>Problem: What is 100% of $17?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement: $12 is 50% of $24.</td>
<td>Statement:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem: What is 200% of $12?</th>
<th>Problem: What is 50% of $5?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement:</td>
<td>Statement:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem: What is 25% of $12?</th>
<th>Problem: What is 50% of $2.50?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement:</td>
<td>Statement:</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Problem: What is 200% of $6.75?</th>
<th>Problem: What is 25% of $5?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Statement:</td>
<td>Statement:</td>
</tr>
</tbody>
</table>
Draw each line segment.

- AB
  - 50% as long as \( AB \)
  - 25% as long as \( AB \)

- CD
  - 25% as long as \( CD \)
  - 100% as long as \( CD \)

- EF
  - 100% as long as \( EF \)
  - 200% as long as \( EF \)

- GH
  - 50% as long as \( GH \)
  - 200% as long as \( GH \)

- IJ
  - 200% as long as \( IJ \)
  - 300% as long as \( IJ \)

- KL
  - 50% as long as \( KL \)
  - 100% as long as \( KL \)
  - 150% as long as \( KL \)
  - 0% as long as \( KL \)

- MN
  - 25% as long as \( MN \)
  - 50% as long as \( MN \)
  - 75% as long as \( MN \)
  - 100% as long as \( MN \)
<table>
<thead>
<tr>
<th>Percentage of 60</th>
<th>Percentage of 44</th>
<th>Percentage of $21</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>100%</td>
<td>100%</td>
<td>200%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of 320</th>
<th>Percentage of 140</th>
<th>Percentage of $85</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>25%</td>
<td>25%</td>
<td>25%</td>
</tr>
<tr>
<td>50%</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>100%</td>
<td>100%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of $5</th>
<th>Percentage of $27</th>
<th>Percentage of $200</th>
</tr>
</thead>
<tbody>
<tr>
<td>300%</td>
<td>300%</td>
<td>0%</td>
</tr>
<tr>
<td>0%</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of 36492</th>
<th>Percentage of 43621</th>
<th>Percentage of $220</th>
</tr>
</thead>
<tbody>
<tr>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
<tr>
<td>50%</td>
<td>100%</td>
<td>50%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of 1123456789</th>
<th>Percentage of 11111</th>
<th>Percentage of $1835.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>0%</td>
<td>300%</td>
<td>0%</td>
</tr>
<tr>
<td>100%</td>
<td>0%</td>
<td>100%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Percentage of $25</th>
<th>Percentage of $19</th>
<th>Percentage of $30</th>
</tr>
</thead>
<tbody>
<tr>
<td>50%</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>$12.50</td>
<td>$4.75</td>
<td>$7.50</td>
</tr>
</tbody>
</table>

©1988 by Key Curriculum Project, Inc.  
Do not duplicate without permission.
One Tenth as a Percent

Shade ten small squares.

What percent of the large square is shaded? _____%

You shaded \( \frac{10}{100} \) or \( \frac{1}{10} \) of the large square.

One tenth of something is _____% of it.

\[ \frac{1}{10} = _____\%
\]

To find 10% of a number, simply divide by 10.

\[
\begin{array}{c|cc}
\frac{1}{10} \text{ of } 50 & 50+10 & 10\% \text{ of } 50 \\
\hline
\frac{1}{10} \text{ of } 20 & 20+10 & 10\% \text{ of } 20 \\
\end{array}
\]

\[
\begin{array}{c|cc}
\frac{1}{10} \text{ of } 900 & 900+10 & 10\% \text{ of } 900 \\
\hline
\frac{1}{10} \text{ of } 40 & 40+10 & 10\% \text{ of } 40 \\
\end{array}
\]

Dividing by 10 is easy when the number you're dividing ends in zero. You don't need pencil and paper. Simply drop the last zero.

\[
\begin{array}{c|cc}
30 & 100\% \text{ is } 30 & 10\% \text{ is } 3 \\
70 & 100\% \text{ is } 70 & 10\% \text{ is } 7 \\
120 & 100\% \text{ is } 120 & 10\% \text{ is } 12 \\
300 & 100\% \text{ is } 300 & 10\% \text{ is } 30 \\
\end{array}
\]

\[
\begin{array}{c|cc}
10\% \text{ of } 10 & 10\% \text{ of } 60 & 10\% \text{ of } 750 \\
10\% \text{ of } 20 & 10\% \text{ of } 120 & 10\% \text{ of } 1500 \\
10\% \text{ of } 30 & 10\% \text{ of } 180 & 10\% \text{ of } 2250 \\
10\% \text{ of } 40 & 10\% \text{ of } 240 & 10\% \text{ of } 3000 \\
\end{array}
\]

\[
\begin{array}{c|cc}
\text{is } 10\% \text{ of } 80. & \text{is } 10\% \text{ of } 390. & \text{is } 10\% \text{ of } 4560. \\
5 \text{ is } 10\% \text{ of } & 48 \text{ is } 10\% \text{ of } & 125 \text{ is } 10\% \text{ of } \\
\end{array}
\]

©1988 by Key Curriculum Project, Inc.
Do not duplicate without permission.
Each pie chart has been divided into equal parts. What percent is shaded? What percent is not shaded?

If you know 10% of a number, you can easily find 20%, 30%, or 40% of the number.

10% of 90 is \( \frac{9}{10} \times 9 = 8.1 \)  
10% of 300 is \( \frac{9}{10} \times 300 = 270 \)

20% of 90 is \( \frac{1}{5} \times 9 = 18 \)  
20% of 300 is \( \frac{1}{5} \times 300 = 60 \)

30% of 90 is \( \frac{3}{10} \times 9 = 27 \)  
30% of 300 is \( \frac{3}{10} \times 300 = 90 \)

40% of 90 is \( \frac{2}{5} \times 9 = 7.2 \)  
40% of 300 is \( \frac{2}{5} \times 300 = 120 \)

50% of 90 is \( \frac{1}{2} \times 9 = 4.5 \)  
50% of 300 is \( \frac{1}{2} \times 300 = 150 \)

60% of 90 is \( \frac{3}{5} \times 9 = 5.4 \)  
60% of 300 is \( \frac{3}{5} \times 300 = 180 \)

70% of 90 is \( \frac{7}{10} \times 9 = 6.3 \)  
70% of 300 is \( \frac{7}{10} \times 300 = 210 \)

80% of 90 is \( \frac{4}{5} \times 9 = 7.2 \)  
80% of 300 is \( \frac{4}{5} \times 300 = 240 \)

90% of 90 is \( \frac{9}{10} \times 9 = 8.1 \)  
90% of 300 is \( \frac{9}{10} \times 300 = 270 \)

100% of 90 is \( \frac{1}{1} \times 9 = 9 \)  
100% of 300 is \( \frac{1}{1} \times 300 = 300 \)

110% of 90 is \( \frac{11}{10} \times 9 = 9.9 \)  
110% of 300 is \( \frac{11}{10} \times 300 = 330 \)

120% of 90 is \( \frac{6}{5} \times 9 = 10.8 \)  
120% of 300 is \( \frac{6}{5} \times 300 = 360 \)

\( \frac{1}{10} \times 50 = \) 10% of $50.  
10% of 240 is \( \frac{1}{10} \times 240 = 24 \)

\( \frac{1}{5} \times 50 = \) 20% of $50.  
20% of 240 is \( \frac{1}{5} \times 240 = 48 \)

\( \frac{3}{10} \times 50 = \) 30% of $50.  
30% of 240 is \( \frac{3}{10} \times 240 = 72 \)
One Hundredth as a Percent

Shade one small square.

What percent of the large square is shaded? _____%  
You shaded $\frac{1}{100}$ of the large square.

One hundredth of something is _____% of it. $\frac{1}{100} = _____%$

To find 1% of a number, simply divide by 100.

<table>
<thead>
<tr>
<th>$\frac{1}{100}$ of 300 is ____</th>
<th>1% of 300 is ____</th>
<th>$\frac{1}{100}$ of 500 is ____</th>
<th>1% of 500 is ____</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{1}{100}$ of 700 is ____</td>
<td>1% of 700 is ____</td>
<td>$\frac{1}{100}$ of 900 is ____</td>
<td>1% of 900 is ____</td>
</tr>
</tbody>
</table>

Dividing by 100 is easy when the number you're dividing ends in two zeros. Simply drop the last two zeros.

<table>
<thead>
<tr>
<th>300</th>
<th>700</th>
<th>1200</th>
<th>3000</th>
</tr>
</thead>
<tbody>
<tr>
<td>100% is ____</td>
<td>100% is ____</td>
<td>100% is ____</td>
<td>100% is ____</td>
</tr>
<tr>
<td>1% is ____</td>
<td>1% is ____</td>
<td>1% is ____</td>
<td>1% is ____</td>
</tr>
</tbody>
</table>

1% of 100 is ____.
1% of 200 is ____.
1% of 300 is ____.
1% of 400 is ____.

_____ is 1% of 900.

5 is 1% of ____.

1% of 400 is ____.
1% of 800 is ____.
1% of 1200 is ____.
1% of 1600 is ____.

_____ is 1% of 3900.

48 is 1% of ____.

1% of $2300$ is ____.
1% of $4600$ is ____.
1% of $6900$ is ____.
1% of $9200$ is ____.

_____ is 1% of 9900.

125 is 1% of ____.
If you know 1% of a number, you can easily find 2%, 3%, or 4% of the number.

| 1% of 600 is 6 | 1% of 1200 is _____ . |
| 2% of 600 is _____ | 2% of 1200 is _____ |
| 3% of 600 is _____ | 3% of 1200 is _____ |
| 4% of 600 is _____ | 4% of 1200 is _____ |
| 5% of 600 is _____ | 5% of 1200 is _____ |
| 6% of 600 is _____ | 6% of 1200 is _____ |
| _____ is 1% of 900. | 1% of 1500 is _____ |
| _____ is 2% of 900. | 2% of 1500 is _____ |
| _____ is 3% of 900. | 3% of 1500 is _____ |
| _____ is 4% of 900. | 4% of 1500 is _____ |
| _____ is 5% of 900. | 5% of 1500 is _____ |
| _____ is 6% of 900. | 6% of 1500 is _____ |
| _____ is 7% of 900. | 7% of 1500 is _____ |
| _____ is 8% of 900. | 8% of 1500 is _____ |
| _____ is 9% of 900. | 9% of 1500 is _____ |
| _____ is 10% of 900. | 10% of 1500 is _____ |

1% of 1500 is _____ . 1% of $7500 is _____ .
2% of 1500 is _____ . 2% of $7500 is _____ .
3% of 1500 is _____ . 3% of $7500 is _____ .
4% of 1500 is _____ . 4% of $7500 is _____ .
5% of 1500 is _____ . 5% of $7500 is _____ .
6% of 1500 is _____ . 6% of $7500 is _____ .
7% of 1500 is _____ . 7% of $7500 is _____ .
8% of 1500 is _____ . 8% of $7500 is _____ .
9% of 1500 is _____ . 9% of $7500 is _____ .
10% of 1500 is _____ . 10% of $7500 is _____ .

Each group of problems has a pattern. Finding the pattern can help you get the answer quickly.

| 100% | 200 |
| 1% | 2 | 5 |
| 2% | 4 |
| 4% | 100 |
| 8% | 81% |
| 16% |

| 100% | 600 |
| 1% | 8 |
| 3% |
| 9% |
| 27% |
| 81% |

| 100% | 1100 |
| 1% | 3 |
| 5% |
| 10% | 70 |
| 50% |
Practice with 1% and 10%

100% of 200 is ______
10% of 200 is ______
1% of 200 is ______

100% is ______% of 60.
10% is ______% of 60.
1% is ______% of 600.

4 is ______% of 4.
4 is ______% of 40.
4 is ______% of 400.

100% of 1300 is ______
10% of 1300 is ______
1% of 1300 is ______

____ is 10% of 190.
____ is 1% of 1900.

2 is ______% of 200.
2 is ______% of 2.
2 is ______% of 20.

50 is ______% of 5000.
50 is ______% of 500.
50 is ______% of 50.

Make up some problem sets of your own.

1% of ______ is ______
10% of ______ is ______
100% of ______ is ______

1% of ______ is ______
10% of ______ is ______
100% of ______ is ______

©1988 by Key Curriculum Project, Inc.
Do not duplicate without permission.
Finding 10% or 1% of dollar amounts can be confusing when the amount is expressed as a decimal. It helps to think of the amount as all cents.

True or false?

10% of $.90 is $.09  
True  False

10% of $3.00 is $.03  
True  False

10% of $.50 is $.05  
True  False

10% of $1.50 is $1.05  
True  False

10% of $2.00 is $.20  
True  False

10% of $14.50 is $1.45  
True  False

10% of $.70 is $7.00  
True  False

10% of $16.00 is $1.60  
True  False

10% of $.29 is $.29  
True  False

Remember, in order to properly show cents with a decimal point, the decimal must show hundredths.

10% of $1.60 is $.160  
True  False

10% of $4.70 is $.047  
True  False

10% of $300 is $30  
True  False

1% of $600 is $6  
True  False

1% of $7.00 is $.07  
True  False

1% of $800 is $8  
True  False

1% of $300.00 is $30.00  
True  False

1% of $12 is $.12  
True  False

1% of $53 is $5.30  
True  False
Complete each sales receipt.

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Pair Skates</td>
<td>$70.00</td>
</tr>
<tr>
<td>1 Pair Socks</td>
<td>$3.50</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td>$73.50</td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td>$7.35</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>$80.85</td>
</tr>
</tbody>
</table>

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Basketball</td>
<td></td>
</tr>
<tr>
<td>1 Hoop</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Ski Set</td>
<td></td>
</tr>
<tr>
<td>1 Pair Skates</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bicycle</td>
<td></td>
</tr>
<tr>
<td>1 Helmet</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Bat</td>
<td></td>
</tr>
<tr>
<td>1 Softball</td>
<td></td>
</tr>
<tr>
<td>1 Glove</td>
<td></td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

**Buena Sports**

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Subtotal</strong></td>
<td></td>
</tr>
<tr>
<td><strong>10% Tax</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
</tr>
</tbody>
</table>

Make up your own.
The population of Rodeo City is 6,000,000. City planners expect it to grow by 1% each year for the next three years. Complete the chart to show how the population will grow. The population at the end of each year is the population at the beginning of the next year.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population (Beginning of year)</td>
<td>6000000</td>
<td>6060000</td>
</tr>
<tr>
<td>1% Increase</td>
<td>60000</td>
<td></td>
</tr>
<tr>
<td>Population (End of year)</td>
<td>6060000</td>
<td></td>
</tr>
</tbody>
</table>

Choose a word from the box to make each sentence true.

A cent is worth 10% of a **dime**.
A year is 10% of a **decade**.
A millimeter is 10% of a **centimeter**.
A decade is 10% of a **century**.
A dime is 10% of a **dollar**.

Make three different true sentences using words from the box.

A _______ is 1% of a _______.
A _______ is 1% of a _______.
A _______ is 1% of a _______.

Fill in each blank.

10% of 1 minute is _____ seconds.
10% of 2 minutes is _____ seconds.
10% of 3 minutes is _____ seconds.
10% of 1 hour is _____ minutes.
10% of 2 hours is _____ minutes.
10% of 3 hours is _____ minutes. 10% of 1 day is _____ minutes.
Other Percents

Shade 150% of a large square.

Shade 135% of a large square.

Shade 100% of a large square.

Shade 10% of a large square.

Shade 300% of a large square.

Shade 250% of a large square.

Shade 50% of a large square.

Shade 0% of a large square.

Shade 299% of a large square.

Shade 1% of a large square.
Work your way down each column. Can you find the pattern?

Shade 16%.

Shade 8%.

Shade 4%.

Shade 2%.

Shade 1%.

Shade $\frac{1}{2}$%.

Shade 64%.

Shade 16%.

Shade 4%.

Shade 2%.

Shade $\frac{1}{4}$%.

Shade 81%.

Shade 27%.

Shade 9%.

Shade 3%.

Shade 1%.

Shade $\frac{1}{3}$%.
$1.00 = 100\%$

One hundred cents equals one dollar.

Use percent notation or a dollar amount to make each statement true.

$.50$ is _____ of a dollar.

$.75$ is _____ of a dollar.

_____ is 28\% of $1.00$.

_____ is 46\% of $1.00$.

$.25$ is _____ of a dollar.

$.20$ is _____ of $2.00$.

A dime is _____ of a dollar.

A nickel plus a dime plus a quarter is _____ of a dollar.

$1.00$ is _____ of $2.00$.

Three quarters is _____ of a dollar.

$.50$ is _____ of $2.00$.

$.02$ is _____ of $2.00$.

Make up your own!

_____ is _____ of one dollar.

_____ is _____ of two dollars.
One hundred centimeters equals one meter.

Use percent notation or a metric length to make each statement true.

50% of a meter is \( \underline{50} \) cm.

85% of a meter is \( \underline{85} \) cm.

25% of a meter is \( \underline{25} \) cm.

136% of a meter is \( \underline{136} \) cm.

2% of a meter is \( \underline{2} \) cm.

450% of a meter is \( \underline{450} \) cm.

5 cm is \( \underline{\text{5 cm}} \) of a meter.

30 cm is \( \underline{30 \text{ cm}} \) of a meter.

100 cm is \( \underline{1 \text{ m}} \) of a meter.

300 cm is \( \underline{3 \text{ m}} \) of a meter.

\( \underline{100 \text{ cm}} \) is 62% of a meter.

\( \underline{300 \text{ cm}} \) is 198% of a meter.

Answer each question using a complete sentence.

Carlos can stretch his rubber band 83 cm without breaking it. What percent of a meter can Carlos stretch his rubber band?

Norma grows beans. Her tallest plant is 98 centimeters tall. This plant is what percent of a meter?

Alice is a champion high jumper. She can clear 238 cm. What percent of a meter can Alice jump?

In a track meet Jose entered the hop, skip and jump event. He hopped 102 cm, skipped 84 cm and jumped 112 cm. His total distance was what percent of a meter?
### Finding a Percent of a Number

**Match.**

<table>
<thead>
<tr>
<th>0%</th>
<th>1%</th>
<th>10%</th>
<th>25%</th>
<th>50%</th>
<th>100%</th>
<th>200%</th>
<th>300%</th>
</tr>
</thead>
<tbody>
<tr>
<td>one tenth</td>
<td>none</td>
<td>one hundredth</td>
<td>all</td>
<td>one fourth</td>
<td>triple</td>
<td>one half</td>
<td>double</td>
</tr>
</tbody>
</table>

Choose the correct ending for each sentence from the box on the right.

- To find 0% of a number you **write zero**.
- To find 1% of a number you **write zero**.
- To find 10% of a number you **write zero**.
- To find 25% of a number you **write zero**.
- To find 50% of a number you **write zero**.
- To find 100% of a number you **write zero**.
- To find 200% of a number you **write zero**.
- To find 300% of a number you **write zero**.

Make each statement true.

- 25% of 400 is **400** divided by **4**. 0% of 400 is **400**.
- 10% of 400 is **40** divided by **10**. 1% of 400 is **4** divided by **40**.
- 100% of 400 is **400**. 300% of 400 is **400** times **3**.
- 50% of 400 is **200**.
- 200% of 400 is **800**.
25% of 16 is ______. 25% of $80 is ______. ______ is 25% of 400.
50% of 16 is ______. 50% of $80 is ______. ______ is 50% of 400.
75% of 16 is ______. 75% of $80 is ______. ______ is 75% of 400.
100% of 16 is ______. 100% of $80 is ______. ______ is 100% of 400.
125% of 16 is ______. 125% of $80 is ______. ______ is 125% of 400.

Start here.

0% of 60 is ______.

0% of 120 is ______.

Start here.

25% of 60 is ______. 25% of 120 is ______.
50% of 60 is ______. 50% of 120 is ______.
100% of 60 is ______. 100% of 120 is ______.

200% of 60 is ______. 200% of 120 is ______.
300% of 60 is ______. 300% of 120 is ______.

1% of $200 is ______. 1% of 3700 is ______.
10% of $200 is ______. 10% of 3700 is ______.
25% of $200 is ______. 25% of 3700 is ______.
50% of $200 is ______. 50% of 3700 is ______.
100% of $200 is ______. 100% of 3700 is ______.

200% of $200 is ______. 200% of 3700 is ______.
300% of $200 is ______. 300% of 3700 is ______.

100% of 48 is ______. 100% of 120 is ______.
50% of 48 is ______. 5% of 120 is ______.
25% of 48 is ______. 2.5% of 120 is ______.
12.5% of 48 is ______. 1.25% of 120 is ______.
5 is _____ of 500.
50 is _____ of 500.
125 is _____ of 500.
250 is _____ of 500.
500 is 100% of 500.
1000 is _____ of 500.
1500 is _____ of 500.

0 is _____ of 120.
30 is _____ of 120.
60 is _____ of 120.
90 is _____ of 120.
120 is _____ of 120.

100 is _____ of 1000.
200 is _____ of 1000.
300 is _____ of 1000.
400 is _____ of 1000.

$4 is _____ of $400.
$40 is _____ of $400.
$100 is _____ of $400.
$200 is _____ of $400.
$400 is _____ of $400.

$15 is _____ of $150.
$30 is _____ of $150.
$45 is _____ of $150.
$60 is _____ of $150.
$75 is _____ of $150.
$90 is _____ of $150.
$105 is _____ of $150.
$120 is _____ of $150.
$135 is _____ of $150.
$150 is _____ of $150.
$165 is _____ of $150.

$7 is _____ of $70.
$14 is _____ of $70.
$21 is _____ of $70.
$28 is _____ of $70.
$35 is _____ of $70.
$5 is _____ of $50.
$10 is _____ of $50.
$20 is _____ of $50.
$40 is _____ of $50.
$80 is _____ of $50.

What percent of the problems on this page do you think you did correctly? _____
Pat took the test below. Put \( C \) by each problem Pat did correctly and \( X \) by each answer that is wrong. Don't write anything by the problems that Pat did not do.

<table>
<thead>
<tr>
<th>Percent Quiz</th>
<th>Pat</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. 100% of 53 is 53. ( C )</td>
<td>11. 10% of 1500 is ____</td>
</tr>
<tr>
<td>2. 0% of 53 is 53. ( X )</td>
<td>12. 1% of 200 is ____</td>
</tr>
<tr>
<td>3. 50% of 128 is 64.</td>
<td>13. 1% of 1500 is ____</td>
</tr>
<tr>
<td>4. 50% of $20 is $10.</td>
<td>14. 1% of 300 is 3.</td>
</tr>
<tr>
<td>5. 50% of 48cm is 24cm.</td>
<td>15. 2% of 300 is 6.</td>
</tr>
<tr>
<td>6. 50% of 21 is ____</td>
<td>16. 3% of 300 is ____</td>
</tr>
<tr>
<td>7. 25% of 32 is 8.</td>
<td>17. 6% of 300 is 12.</td>
</tr>
<tr>
<td>8. 25% of 64 is 24.</td>
<td>18. 12 is 50% of 6.</td>
</tr>
<tr>
<td>9. 25% of 96 is 24.</td>
<td>19. 12 is 100% of 12.</td>
</tr>
<tr>
<td>10. 10% of 200 is 20.</td>
<td>20. 12 is 50% of 24.</td>
</tr>
</tbody>
</table>

There are five mistakes on Pat's paper.

What percent of the problems on the test did Pat do wrong? _____

How many of the problems did Pat not do? _____

What percent of the problems on the test did Pat not do? _____

What percent of the problems on the test did Pat do correctly? _____

How would you rate Pat's work? □ Poor □ Fair □ Good □ Excellent

©1988 by Key Curriculum Project, Inc.
Do not duplicate without permission.
You know how to find these percents of some numbers:

- 1%
- 10%
- 25%
- 50%
- 100%
- 200%
- 300%

You can use these familiar percents to figure out other percents.

- ___% = 25% + 1%
- ___% = 10% + 10% + 1%
- ___% = 25% - 1% - 1%

24% = __________________
75% = __________________
9% = __________________

51% = __________________
35% = __________________
299% = __________________

The first and second problems in each group are easy. You can find the answers to the two harder problems by adding or subtracting the first two answers.

- 25% of 200 is 50.
- 1% of 200 is 2.
- 24% of 200 is 48.
- 26% of 200 is 52.

- 50% of 600 is ___.
- 1% of 600 is ___.
- 51% of 600 is ___.
- 49% of 600 is ___.

- 25% of 160 is ___.
- 10% of 160 is ___.
- 35% of 160 is ___.
- 15% of 160 is ___.

- 200% of 36 is ___.
- 25% of 36 is ___.
- 175% of 36 is ___.
- 225% of 36 is ___.

- 100% of 210 is ___.
- 10% of 210 is ___.
- 90% of 210 is ___.
- 110% of 210 is ___.

- 10% of 400 is ___.
- 1% of 400 is ___.
- 11% of 400 is ___.
- 9% of 400 is ___.
Estimating Percents

Use a number in the box to name the shaded part of each circle.

<table>
<thead>
<tr>
<th>23%</th>
<th>56%</th>
<th>5%</th>
<th>75%</th>
<th>33%</th>
<th>95%</th>
<th>2(\frac{1}{2})%</th>
<th>12(\frac{1}{2})%</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Shade about 50%.</th>
<th>Shade about 60%.</th>
<th>Shade about 70%.</th>
<th>Shade about 80%.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shade about 25%.</td>
<td>Shade about 75%.</td>
<td>Shade about 10%.</td>
<td>Shade about 5%.</td>
</tr>
</tbody>
</table>

Match a number in the box with each approximate amount.

<table>
<thead>
<tr>
<th>9%</th>
<th>26%</th>
<th>52%</th>
<th>47%</th>
<th>199%</th>
<th>105%</th>
</tr>
</thead>
</table>

- a little more than one quarter
- a little more than one half
- a little less than one half
- a little less than one tenth
- a little more than all
- a little less than double

Shade part of each circle. Use a straightedge so that your work will be neat.
Which set of percents best fits the pie chart? Write the percents on the pie pieces.

<table>
<thead>
<tr>
<th>10%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>25%</td>
<td>75%</td>
</tr>
<tr>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

Divide each circle below to show the percents given. Write the percents on your pieces of pie. You'll have to estimate to decide how big to make each piece.

<table>
<thead>
<tr>
<th>10%</th>
<th>20%</th>
<th>70%</th>
</tr>
</thead>
<tbody>
<tr>
<td>20%</td>
<td>30%</td>
<td>50%</td>
</tr>
<tr>
<td>25%</td>
<td>25%</td>
<td>50%</td>
</tr>
<tr>
<td>30%</td>
<td>30%</td>
<td>40%</td>
</tr>
</tbody>
</table>

In the year 2000, it is estimated that 6,121,000,000 people will live on earth.

Make a pie chart to show the information below. Label each piece of pie with the name of a continent and a percent. The size of each should match its percent.

About 60% will live in Asia.

About 15% will live in Africa.

About 11% will live in Europe.

About 9% will live in South America.

About 5% will live in North America.

World Population
Circle the percent that best answers the question.

- About what percent of the square is shaded?
  - 25% 50% 75%

- About what percent of the cup is filled?
  - 10% 25% 50%

- About what percent of the square is shaded?
  - 25% 50% 75%

- About what percent of the circle is shaded?
  - 25% 50% 75%

- About what percent of the dots are circled?
  - 1% 10% 25%

- About what percent of the circle is shaded?
  - 25% 50% 75%

- About what percent of the dots are circled?
  - 25% 50% 75%

- About what percent of the square is shaded?
  - 25% 50% 75%

- About what percent of the square is shaded?
  - 25% 50% 75%

- About what percent of the cup is filled?
  - 10% 25% 50%

- About what percent of the square is shaded?
  - 25% 50% 75%

- About what percent of the rug is stained?
  - 1% 10% 25%

- About what percent of the rug is stained?
  - 75% 100% 125%

- About what percent of the square is shaded?
  - 75% 100% 125%
Percent is Based on 100

Pat plays on the school basketball team. In the first game of the season, Pat made 3 out of 4 shots. In the second game Pat made 4 out of 5 and in the third 7 out of 10. Pat wondered, "In which game did I shoot the best?" How can Pat find out?

It would be easy to tell if Pat had tried the same number of shots in each game. Let's pretend that Pat had continued to make 3 out of every 4, or 4 out of every 5, or 7 out of every 10 shots for 100 tries.

You complete the tables below to find Pat's shooting percent in Games 2 and 3.

Game 1

| Shots made | 3 6 9 12 15 30 45 60 75 |
| Shots tried | 4 8 12 16 20 40 60 80 100 |

3 out of 4 is 75%.

Game 2

| Shots made | 4 6 |
| Shots tried | 5 10 20 30 40 50 100 |

4 out of 5 is ___%.

Game 3

| Shots made | 7 |
| Shots tried | 10 20 30 40 50 100 |

7 out of 10 is ___%.

In which game did Pat shoot the best? _______________

Complete the tables to find the shooting percents of three other players in Game 1.

Sandy

| Shots made | 13 |
| Shots tried | 20 40 60 80 100 |

13 out of 20 is ___%.

Terry

| Shots made | 6 |
| Shots tried | 10 20 30 40 50 100 |

6 out of 10 is ___%.

Chris

| Shots made | 12 |
| Shots tried | 25 50 75 100 |

12 out of 25 is ___%.

Who was the most accurate shooter, Sandy, Terry or Chris?
Complete the table to solve each problem below.

Jan got 12 out of 20 votes for class president. What percent of the votes did Jan get?

<table>
<thead>
<tr>
<th>Votes for Jan</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total votes</td>
<td>20</td>
</tr>
</tbody>
</table>

12 out of 20 is ____%.
Jan got ____% of the votes.

Philip got 24 out of 30 problems correct on his math test. What percent of the problems did he get correct?

<table>
<thead>
<tr>
<th>Problems correct</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems on test</td>
<td>30</td>
</tr>
</tbody>
</table>

24 out of 30 is ____%.
Philip got ____% of the problems correct.

Tanya got 18 hits in 40 times at bat playing softball last season. What was her batting average?

<table>
<thead>
<tr>
<th>Hits</th>
<th>18</th>
</tr>
</thead>
<tbody>
<tr>
<td>Times at bat</td>
<td>40</td>
</tr>
</tbody>
</table>

18 out of 40 is ____%.
Her batting average was ____%.

The algebra class at Smalltown High School has 36 students. 30 is supposed to be the class size limit. What percent of the size limit was the algebra class?

<table>
<thead>
<tr>
<th>Students in class</th>
<th>36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class size limit</td>
<td>30</td>
</tr>
</tbody>
</table>

36 compared to 30 is ____%.
There were ____% as many students in the class as there were supposed to be.

Make up your own table to solve each problem below.

18 of 20 students in Ms. Serra's French class came to class last Friday. What percent of the class was present?

<table>
<thead>
<tr>
<th>Present</th>
<th>In the class</th>
</tr>
</thead>
</table>

18 out of 20 is ____%.
____% of the class was present.

The Bay High girl's softball team has won 18 of their last 30 games. What percent of their last 30 games have they won?

<table>
<thead>
<tr>
<th>Games won</th>
<th>Games played</th>
</tr>
</thead>
</table>

8 out of 30 is ____%.
They have won ____% of their last 30 games.

Pat and Chris are digging a ditch that will be 25 meters long. They have dug 7 meters. What percent of the ditch have they dug?

<table>
<thead>
<tr>
<th>Meters dug</th>
<th>Meters of ditch</th>
</tr>
</thead>
</table>

7 out of 25 is ____%.
They have dug ____% of the ditch.
**Key to Percents Book 1**

**Practice Test**

Write each percent in three ways.

<table>
<thead>
<tr>
<th>Using words</th>
<th>As a fraction with denominator 100</th>
<th>As a number with percent notation</th>
</tr>
</thead>
</table>
| 25 out of every 100         | \[
|                             | \frac{5}{100}                      | 100\%                           |

**What percent of each figure is shaded?**

- ____% is shaded.  
- ____% is shaded.  
- ____% is shaded.  
- ____% is not shaded.  
- ____% is not shaded.  
- ____% is not shaded.

**Put hair on 50% of the heads.**

**Put a nose on 25% of the heads.**

**Put a smile on 100% of the heads.**

Fill in the missing percent. Then answer the question.

**Students at Cabot High School**

- 0% of 35 is ____.
- 25% of 1600 is ____.
- 25% of 16 is ____.
- 0% of 7643 is ____.
- 50% of 48 is ____.
- 100% of 985 is ____.
- 100% of 80 is ____.
- 50% of 4444 is ____.
- 2 is ____% of 8.
- 6 is ____% of 12.
- 32% 12th Grade
- 26% 11th Grade
- 25% 10th Grade
- 32% 9th Grade

©1988 by Key Curriculum Project, Inc.  
Do not duplicate without permission.
Practice Test - Page 2

100% of 25 is _____.

10% of 600 is _____.

1% of 900 is _____.

200% of 25 is _____.

20% of 600 is _____.

2% of 900 is _____.

300% of 25 is _____.

30% of 600 is _____.

3% of 900 is _____.

Complete the sales receipt.

Buena Sports

<table>
<thead>
<tr>
<th>Item</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sweatshirt</td>
<td>$12.95</td>
</tr>
<tr>
<td>Pair Sneakers</td>
<td>$29.95</td>
</tr>
<tr>
<td>Subtotal</td>
<td></td>
</tr>
<tr>
<td>10% Tax</td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
</tr>
</tbody>
</table>

One quarter is ____% of a dollar.

A dime plus a nickel is ____% of a dollar.

1 centimeter is ____% of a meter.

50 centimeters is ____% of a meter.

One decade is ____% of a century.

10% of one hour is ____ minutes.

25% of 200 is _____.

1% of 200 is _____.

24% of 200 is _____.

26% of 200 is _____.

35% of 40 is _____.

Complete the table to answer the question.

Aran got 32 out of 40 problems correct on his math test. What percent did he get correct?

<table>
<thead>
<tr>
<th>Problems correct</th>
<th>32</th>
</tr>
</thead>
<tbody>
<tr>
<td>Problems on test</td>
<td>40</td>
</tr>
</tbody>
</table>

32 out of 40 is ____%.

Aran got ____% of the problems correct.

Circle the percent that best names the part that is shaded.

- 10%
- 25%
- 50%
- 25%
- 50%
- 75%
Key to Percents® workbooks
Book 1: Percent Concepts
Book 2: Percents and Fractions
Book 3: Percents and Decimals

Answers and Notes for Books 1–3
Reproducible Tests for Books 1–3

Also available in the Key to...® series
Key to Fractions®
Key to Decimals®
Key to Algebra®
Key to Geometry®
Key to Measurement®
Key to Metric Measurement®
The Key to Tracker®, the online companion for the
Key to Percents, Fractions, Decimals, and Algebra workbooks

Key Curriculum Press
INNOVATORS IN MATHEMATICS EDUCATION