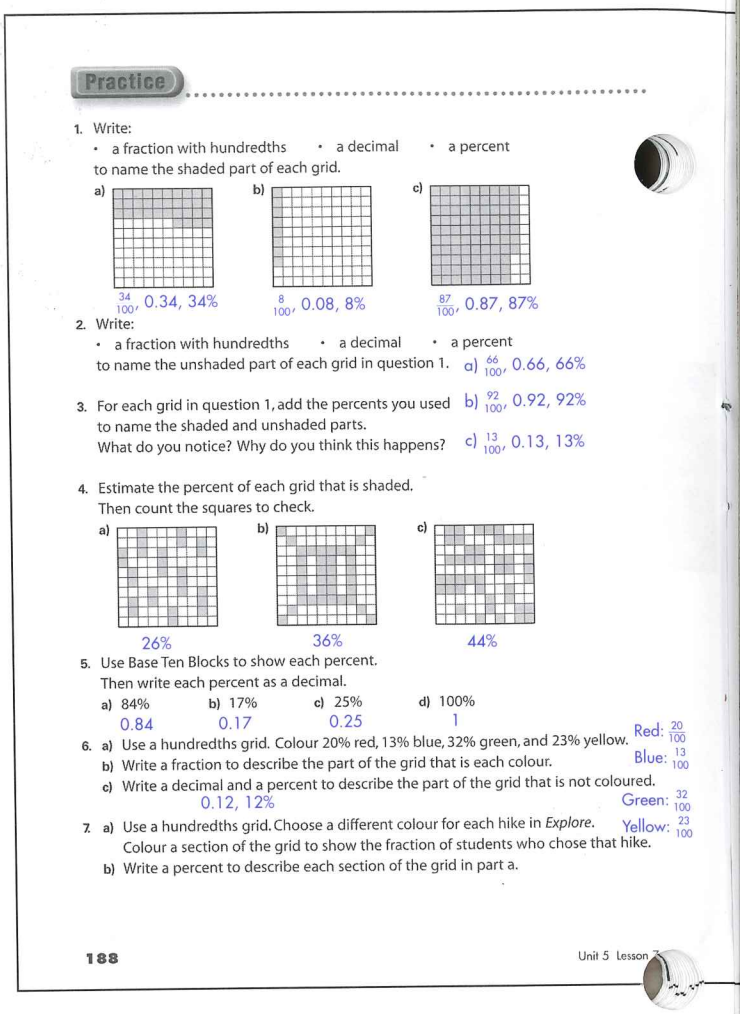
Sample Solutions

3. The shaded and unshaded parts in each grid add up to 100%. This is because there are 100 squares in each grid.
4. Estimates will vary.
5. a) 8 tenth rods and 4 hundredth cubes
   b) 1 tenth rod and 7 hundredth cubes
   c) 2 tenth rods and 5 hundredth cubes
   d) 1 unit flat
6. a) Students should colour 20 squares red, 13 squares blue, 32 squares green, and 23 squares yellow. There should be 12 squares that are not coloured.
   c) $20 + 13 + 32 + 23 = 88$ of the 100 hundred squares are coloured, so $\frac{88}{100}$ of the grid is coloured. Thus, $\frac{12}{100}$, or 0.12, or 12%, of the grid is not coloured.
7. a) Students' grids should be coloured as follows (colours may vary):
   Red: Camel's End Coulee Hike, 21 squares
   Blue: Centrosaurus Bone Bed Hike, 24 squares
   Green: Great Badlands Hike, 33 squares
   Yellow: Fossil Safari Hike, 22 squares
   b) In the same order as part a: 21%, 24%, 33%, 22%
10. All Earth's water is 100%. $100\% - 97\% = 3\%$
    So, 3% is fresh water.
11. a) Apple: $\frac{90}{100}$; Watermelon: $\frac{95}{100}$;
    Orange: $\frac{90}{100}$; Potato: $\frac{80}{100}$
12. b) She was charged \$11 less than the regular price, or $\frac{11}{100}$ less, which is an 11% discount.



Practice

1. Write:
   • a fraction with hundredths • a decimal • a percent
   to name the shaded part of each grid.
   a) b) c)
   $\frac{34}{100}$, 0.34, 34% $\frac{8}{100}$, 0.08, 8% $\frac{87}{100}$, 0.87, 87%
2. Write:
   • a fraction with hundredths • a decimal • a percent
   to name the unshaded part of each grid in question 1. a) $\frac{66}{100}$, 0.66, 66%
3. For each grid in question 1, add the percents you used to name the shaded and unshaded parts.
   What do you notice? Why do you think this happens? b) $\frac{92}{100}$, 0.92, 92%
   c) $\frac{13}{100}$, 0.13, 13%
4. Estimate the percent of each grid that is shaded.
   Then count the squares to check.
   a) b) c)
   26% 36% 44%
5. Use Base Ten Blocks to show each percent.
   Then write each percent as a decimal.
   a) 84% b) 17% c) 25% d) 100%
   0.84 0.17 0.25 1
6. a) Use a hundredths grid. Colour 20% red, 13% blue, 32% green, and 23% yellow. Red: $\frac{20}{100}$
   b) Write a fraction to describe the part of the grid that is each colour. Blue: $\frac{13}{100}$
   c) Write a decimal and a percent to describe the part of the grid that is not coloured.
   0.12, 12% Green: $\frac{32}{100}$
7. a) Use a hundredths grid. Choose a different colour for each hike in *Explore*. Yellow: $\frac{23}{100}$
   Colour a section of the grid to show the fraction of students who chose that hike.
   b) Write a percent to describe each section of the grid in part a.

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How do you know?
(You read each fraction and its equivalent decimal the same way. You read $\frac{21}{100}$ and 0.21 as twenty-one hundredths; $\frac{24}{100}$ and 0.24 as twenty-four hundredths; $\frac{33}{100}$ and 0.33 as thirty-three hundredths; and $\frac{22}{100}$ and 0.22 as twenty-two hundredths.)

Use *Connect* to introduce the concept of percent and the percent symbol. Ensure students understand that percent means "out of 100."

Invite volunteers to colour a hundredths grid on the overhead projector to represent the data from *Explore*. Have students use the percent symbol to describe the parts of the grid.

Practice

Students need hundredths grids (Master 5.14) for questions 6, 7, and 13, and *Reflect*.
Base Ten Blocks are required for question 5.

For question 10, remind students that water on Earth that is not salt water is fresh water.

Assessment Focus: Question 13

Students add 62% and 48% to determine whether this totals 100%. Students might use a hundredths grid and colour 62 squares one colour and 38 squares a different colour. They might colour 10 squares on another grid to show that it is not possible to have the given percents of girls and boys in the choir.

Students can play the Additional Activity *Letter Percents* (Master 5.12).

8. Write as a percent. Then write as a decimal.

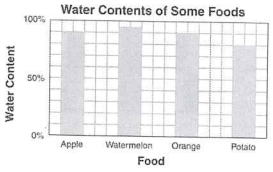
a) 64 out of 100 — 64%, 0.64
b) $\frac{50}{100}$ — 50%, 0.50
c) 1 out of 100 — 1%, 0.01
d) $\frac{17}{100}$ — 17%, 0.17

9. Write each percent as a fraction with hundredths. Then write as a decimal.

a) 13% $\frac{13}{100}$, 0.13
b) 5% $\frac{5}{100}$, 0.05
c) 79% $\frac{79}{100}$, 0.79
d) 64% $\frac{64}{100}$, 0.64

10. Ninety-seven percent of Earth's water is salt water.
What percent is fresh water? 3%
How do you know?

11. The graph shows the water contents of some foods.



a) About what percent of each food is water?
b) About what percent of each food is not water?
c) Write each percent in the graph as a fraction.

a) Apple: about 90%; Watermelon: about 95%; Orange: about 90%; Potato: about 80%

b) Apple: about 10%; Watermelon: about 5%; Orange: about 10%; Potato: about 20%

12. Janette bought a portable CD player on sale.
The regular price was $100. She was charged $89.
a) What percent of the regular price did Janette pay? 89%
b) What percent of the regular price did she receive as a discount? 11%

13. Salvo said that of the 100 singers in a children's choir in Whitehorse, 62% are girls and 48% are boys.
Is this possible? No
Use words and pictures to explain.

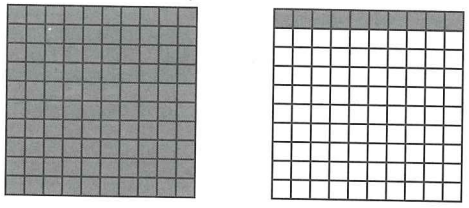
Reflect

What does percent mean?
Use words and pictures to explain.

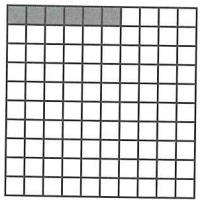
At Home

Percents are often used to describe discounts. Look through some flyers your family receives in the mail. List 3 different percents you see offered as discounts. Order the percents from greatest to least. Which is the best discount?

10. 62% + 48% = 110%
The total must equal 100%, so it is not possible that 62% are girls and 48% are boys.
The hundredths grids show that the total is more than 100%.



REFLECT: Percent means out of 100.
This grid has 100 small squares.



6 out of 100 is 6%.
So, 6% of the grid is shaded.

At Home

Have students look for other places percents are used in the home, such as on food labels. Students can order the percent of a specific nutrient on several different food labels from least to greatest to decide which food contains the greatest amount of that nutrient.

ASSESSMENT FOR LEARNING

What to Look For

Conceptual Understanding

✔ Students can explain that percent means "out of 100."

Procedural Knowledge

✔ Students can use percents to name amounts less than or equal to 1.

✔ Students can name a fraction with denominator 100 as a decimal and as a percent.

What to Do If You Don't See It

Adjust Instruction

Students having difficulty with questions 8 and 9 could use hundredths grids to relate percents to fractions and to decimals.

Have students count out 100 linking cubes and write each colour as a fraction, a decimal, and a percent.

Ask students to look through magazines and newspapers for examples of percents. Have them make a collage of the examples they find and write each percent as a fraction and as a decimal.