

## Sample Solutions

Students draw Base Ten Blocks or hundredths grids for questions 1 to 3. Several sample solutions are given for each question.

1. a) 6 hundredth cubes; 6 squares shaded  
b) 8 tenth rods and 1 hundredth cube; 81 squares shaded  
c) 3 tenth rods and 4 hundredth cubes; 34 squares shaded
  2. b) 3 hundredth cubes; 3 squares shaded  
d) 5 tenth rods; 50 squares shaded  
g) 9 hundredth cubes; 9 squares shaded
  3. f) 6 hundredth cubes; 6 squares shaded  
g) 9 tenth rods; 90 squares shaded  
h) 1 tenth rod and 5 hundredth cubes; 15 squares shaded
4. a)  $\frac{3}{4} = \frac{75}{100} = 75\%$       b)  $1 = \frac{100}{100} = 100\%$   
c)  $\frac{3}{5} = \frac{60}{100} = 60\%$
  5. a)  $\frac{5}{10} = \frac{50}{100} = 50\%$       b)  $\frac{6}{24} = \frac{1}{4} = \frac{25}{100} = 25\%$   
c)  $\frac{15}{25} = \frac{60}{100} = 60\%$
  6. a)  $\frac{7}{10} = \frac{70}{100}$  So,  $\frac{7}{10}$  is greater than 50%.  
b)  $\frac{3}{4} = \frac{75}{100}$  So,  $\frac{3}{4}$  is greater than 50%.  
c)  $\frac{11}{25} = \frac{44}{100}$  So,  $\frac{11}{25}$  is less than 50%.  
d)  $\frac{6}{6} = 1 = 100\%$  So,  $\frac{6}{6}$  is greater than 50%.
  7. Luis may have pressed  $1 \div 4 =$  to get 0.25. Then he may have written 0.25 as 25%.
  8. a) False:  $34\% + 8\% = 42\%$   
b) True:  $13\% + 45\% = 58\%$ ;  $58\% = \frac{58}{100}$

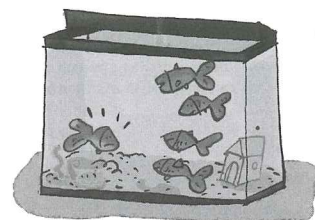
- A fish tank contains rainbow fish and goldfish.  
The ratio of rainbow fish to goldfish in the tank is 1:4.  
What percent of the fish are rainbow fish?

1 out of 5 fish are rainbow fish.

$$\frac{1}{5} = 0.20$$

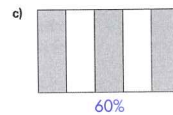
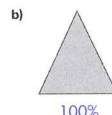
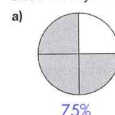
And,  $0.20 = 20\%$

20% of the fish are rainbow fish.



## Practice

1. Draw Base Ten Blocks or shade a hundredths grid to represent each fraction. Write each fraction as a percent and as a decimal.  
a)  $\frac{6}{100}$  6%, 0.06    b)  $\frac{81}{100}$  81%, 0.81    c)  $\frac{17}{50}$  34%, 0.34    d)  $\frac{3}{10}$  30%, 0.3  
e)  $\frac{1}{50}$  2%, 0.02    f)  $\frac{1}{5}$  20%, 0.2    g)  $\frac{7}{20}$  35%, 0.35    h)  $\frac{3}{4}$  75%, 0.75
2. Draw Base Ten Blocks or shade a hundredths grid to represent each decimal. Write each decimal as a fraction and as a percent.  
a) 0.97  $\frac{97}{100}$  97%    b) 0.03  $\frac{3}{100}$  3%    c) 0.16  $\frac{16}{100}$  16%    d) 0.5  $\frac{50}{100}$  50%  
e) 0.65  $\frac{65}{100}$  65%    f) 0.24  $\frac{24}{100}$  24%    g) 0.09  $\frac{9}{100}$  9%    h) 0.7  $\frac{70}{100}$  70%
3. Draw Base Ten Blocks or shade a hundredths grid to represent each percent. Write each percent as a fraction and as a decimal.  
a) 14%  $\frac{14}{100}$  0.14    b) 99%  $\frac{99}{100}$  0.99    c) 25%  $\frac{25}{100}$  0.25    d) 40%  $\frac{40}{100}$  0.4  
e) 35%  $\frac{35}{100}$  0.35    f) 6%  $\frac{6}{100}$  0.06    g) 90%  $\frac{90}{100}$  0.9    h) 15%  $\frac{15}{100}$  0.15
4. What percent of each whole is shaded?  
Show how you found your answers.



192

Unit 5 Lesson 8

an equivalent fraction with denominator 100.

When discussing the third bullet, ask:

- Why was  $\frac{6}{12}$  changed to  $\frac{1}{2}$  before it was written in hundredths? (Because 2 is a factor of 100, but 12 is not.)

Provide other examples for students to work through. For example, draw a figure with 20 equal parts on the board or overhead projector and shade 12 parts. Ask:

- How could you find the percent of the figure that is shaded? ( $\frac{12}{20}$  of the figure is shaded. I can multiply the numerator and the denominator by 5 to write an equivalent fraction with hundredths. Since  $\frac{12}{20} = \frac{60}{100}$ , 60% of the figure is shaded.)

Now draw a figure with 15 equal parts and shade 6 of them. Ask:

- How do you write the percent of the figure that is shaded? ( $\frac{6}{15}$  of the figure is shaded. Since

100 is not a multiple of 15, I first need to write  $\frac{6}{15}$  as  $\frac{2}{5}$ .  
Now I can multiply the numerator and the denominator by 20 to write an equivalent fraction with hundredths. Since  $\frac{2}{5} = \frac{40}{100}$ , 40% of the figure is shaded.)

## Practice

Students require Base Ten Blocks or hundredths grids (Master 5.14) for questions 1 to 3, and a calculator for question 7.

## Assessment Focus: Question 8

Students use relationships among fractions, decimals, and percents to determine whether statements are true or false. In part c, students should convert  $\frac{1}{4}$  to 25%, and compare it to the percent for adults. Similarly, in part d, students write 0.5 as 50% and compare it to the total percent for teens and adults.



5. What percent of each set is shaded?  
Show how you found your answers.



50%



25%



60%

6. Is each fraction greater than or less than 50%?  
Explain how you know.

- a)  $\frac{7}{10}$  Greater b)  $\frac{3}{4}$  Greater c)  $\frac{11}{25}$  Less d)  $\frac{6}{6}$  Greater



7. Luis used a calculator to find a decimal and a percent equal to  $\frac{1}{4}$ .  
How might Luis have done this?



8. Use the data in the table. Is each statement true or false?  
Explain how you know.

- a) More than 50% of the audience were adults or seniors. **False**  
b) Of the audience,  $\frac{58}{100}$  were children or teens. **True**  
c) More than  $\frac{1}{4}$  of the audience were adults. **True**  
d) Less than 0.5 of the audience were teens or adults. **False**

Members of the Audience

Age Group	Percent
Children	13%
Teens	45%
Adults	34%
Seniors	8%

9. Which is least? Which is greatest? 0.01; 10% and  $\frac{1}{10}$

How do you know?  
10%  $\frac{1}{10}$  0.01

10. Ravi got 18 out of 20 on a math quiz.  
Karl got 85% on the quiz.  
Whose mark was greater? How do you know?

Ravi's mark

11. Write a percent that represents:  
a) a very little of something  
b) almost all of something  
c) a little more than  $\frac{1}{4}$  of something  
d) between 0.25 and 0.50 of something  
How did you choose each percent?



### Reflect

How are fractions, decimals, and percents alike?  
How are they different?  
Use examples in your explanations.

ASSESSMENT FOCUS | Question 8

Unit 5 Lesson 8 193

c) True:  $\frac{1}{4} = 25\%$ ;  $34\% > 25\%$

d) False:  $0.5 = 50\%$ ;  $45\% + 34\% = 79\%$ ;  $79\% > 50\%$

9.  $10\% = \frac{1}{10}$ ;  $0.01 = \frac{1}{100}$  So, 0.01 is least and 10% and  $\frac{1}{10}$  are greatest.

10.  $\frac{18}{20} = \frac{90}{100} = 90\%$ ;  $90\% > 85\%$

11. Answers will vary.

a) 2% is close to 0%, so it represents very little of something.

b) 99% is almost 100%, so it represents almost all of something.

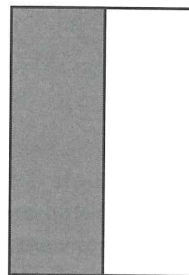
c)  $\frac{3}{4} = 75\%$ , so 77% is a little more than  $\frac{3}{4}$  of something.

d)  $0.25 = 25\%$  and  $0.50 = 50\%$ , so 37% is between 25% and 50%.

**REFLECT:** Fractions, decimals, and percents all describe a part of a whole, but in different ways. The shaded part of this rectangle can be written in 3 ways.

$\frac{1}{2}$ : 1 of 2 equal parts is shaded. I can write  $\frac{1}{2}$  as a

decimal:  $\frac{1}{2} = \frac{50}{100} = 0.5$ , and as a percent:  $\frac{1}{2} = \frac{50}{100} = 50\%$ .



## ASSESSMENT FOR LEARNING

### What to Look For

#### Conceptual Understanding

- ✓ Students can explain the relationships among fractions, decimals, and percents.
- ✓ Students can explain that any fraction of a whole can be described using a percent.

#### Procedural Knowledge

- ✓ Students can convert among fractions, decimals, and percents.

### What to Do If You Don't See It

#### Adjust Instruction

Have students work in pairs to complete question 1. One student shades the grid to show the fraction, and the other student writes the percent and decimal.

Have one student colour hundredths grids (Master 5.14) to show 37%, 45%, 4%, and 86%; have another student colour grids to show 0.37, 0.45, 0.04, and 0.86; and a third student colour grids to show  $\frac{37}{100}$ ,  $\frac{45}{100}$ ,  $\frac{4}{100}$ , and  $\frac{86}{100}$ . Students match the grids that show the same amounts.