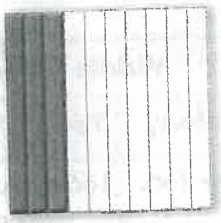
Lesson
9-8

Understand It!
A fraction can also be represented by a decimal.

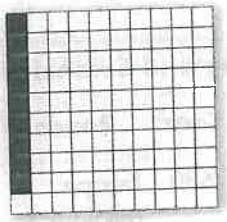
Tenths and Hundredths

How can you write a fraction as a decimal?

A fraction such as $\frac{3}{10}$ or $\frac{9}{100}$ can be shown by a model.



$\frac{3}{10}$



$\frac{9}{100}$

Other Examples

How can you use division to write a fraction as a decimal?

Write $\frac{3}{5}$ as a decimal.

$\frac{3}{5} = 3 \div 5$

Divide the numerator by the denominator.

$$\begin{array}{r} 0.6 \\ 5\overline{)3.0} \\ -\ 30 \\ \hline 0 \end{array}$$

Insert a decimal point after 3 and annex zeros as needed.

So, $\frac{3}{5} = 0.6$.

Write $\frac{1}{4}$ as a decimal.

$\frac{1}{4} = 1 \div 4$

$$\begin{array}{r} 0.25 \\ 4\overline{)1.00} \\ -\ 8\downarrow \\ \hline 20 \\ -\ 20 \\ \hline 0 \end{array}$$

Insert a decimal point after 1 and annex zeros as needed.

So, $\frac{1}{4} = 0.25$.

Explain It

1. How can you write $\frac{9}{100}$ as a division problem?
2. In the second example, how many zeros did you need to annex after 1 when you divided 1 by 4?

Guided Practice*

Do you know HOW?

Write each decimal as a fraction and each fraction as a decimal.

1. 0.1 $= \frac{1}{10}$
2. 0.02 $= \frac{2}{100}$
3. $\frac{9}{10} = .9$
4. $\frac{7}{100} = .07$
5. Use division to change $\frac{11}{20}$ to a decimal. $= .55$

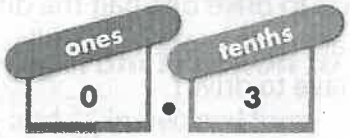
Do you UNDERSTAND?

6. Describe two ways to write a decimal as a fraction.
7. **Writing to Explain** How is $\frac{3}{10}$ equal to 0.3?

$$\begin{array}{r} .55 \\ 20\overline{)11.00} \\ -\ 100\downarrow \\ \hline 100 \\ -\ 100 \\ \hline 0 \end{array}$$

*For another example, see set H on page 252.

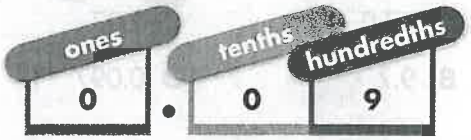
The word name for $\frac{3}{10}$ is three tenths. Three tenths can be shown on a place-value chart,



0.3

So, $\frac{3}{10} = 0.3$.

The word name for $\frac{9}{100}$ is nine hundredths. Nine hundredths can be shown on a place-value chart,



0.09

So, $\frac{9}{100} = 0.09$.

9-8

Independent Practice

In **8** through **11**, write a decimal and fraction for the shaded portion of each model.

8. 

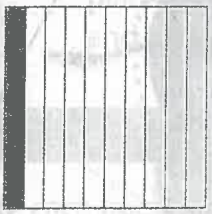
.97

$\frac{97}{100}$

9. 

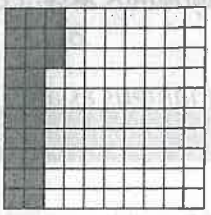
.7

$\frac{7}{10}$

10. 

.1

$\frac{1}{10}$

11. 

.23

$\frac{23}{100}$

In **12** through **19**, write each decimal as either a fraction or a mixed number.

12. 3.2 $3\frac{2}{10}$ **13.** 0.7 $\frac{7}{10}$ **14.** 0.23 $\frac{23}{100}$ **15.** 9.75 $9\frac{75}{100}$

16. 7.7 $7\frac{7}{10}$ **17.** 0.4 $\frac{4}{10}$ **18.** 0.81 $\frac{81}{100}$ **19.** 2.43 $2\frac{43}{100}$

In **20** through **27**, write each fraction or mixed number as a decimal.

20. $2\frac{1}{100}$ 2.01 **21.** $9\frac{3}{10}$ 9.3 **22.** $\frac{9}{10}$ .9 **23.** $1\frac{18}{100}$ 1.18

24. $6\frac{31}{100}$ 6.31 **25.** $4\frac{1}{10}$ 4.1 **26.** $\frac{4}{10}$ .4 **27.** $6\frac{6}{100}$ 6.06

Use division to change each fraction to a decimal.

28. $\frac{2}{5}$ $5\overline{)2.0}$ .4

29. $\frac{3}{25}$ $25\overline{)3.00}$ .12

30. $\frac{7}{50}$ $50\overline{)7.00}$ .14

31. $\frac{9}{20}$ $20\overline{)9.0}$ .45

9-8

Problem Solving

32. What is $\frac{97}{100}$ as a decimal?

A 97.0 **C** 0.97

B 9.7 **D** 0.097

33. Kate drives 234 miles in 5 hours. Felix only has to drive one half the distance that Kate does. How many miles does Felix have to drive? 117 miles

34. What is the value of the underlined digit? 457,140,167

7 million

35. What is the best estimate for this product?
81×409

$80 \times 400 = 32{,}000$

36. Jorge is packing books into boxes. Each box can hold 16 books. Which expression can be used to find the total number of boxes that he needs in order to pack 96 books?

A $96 \div 16$

B $96 - 16$

C $96 + 16$

D 96×16

37. At a high-school graduation, there were 200 students in the class. They were seated in 5 different sections of the auditorium. How many graduates were seated in each section?

A 40

B 195

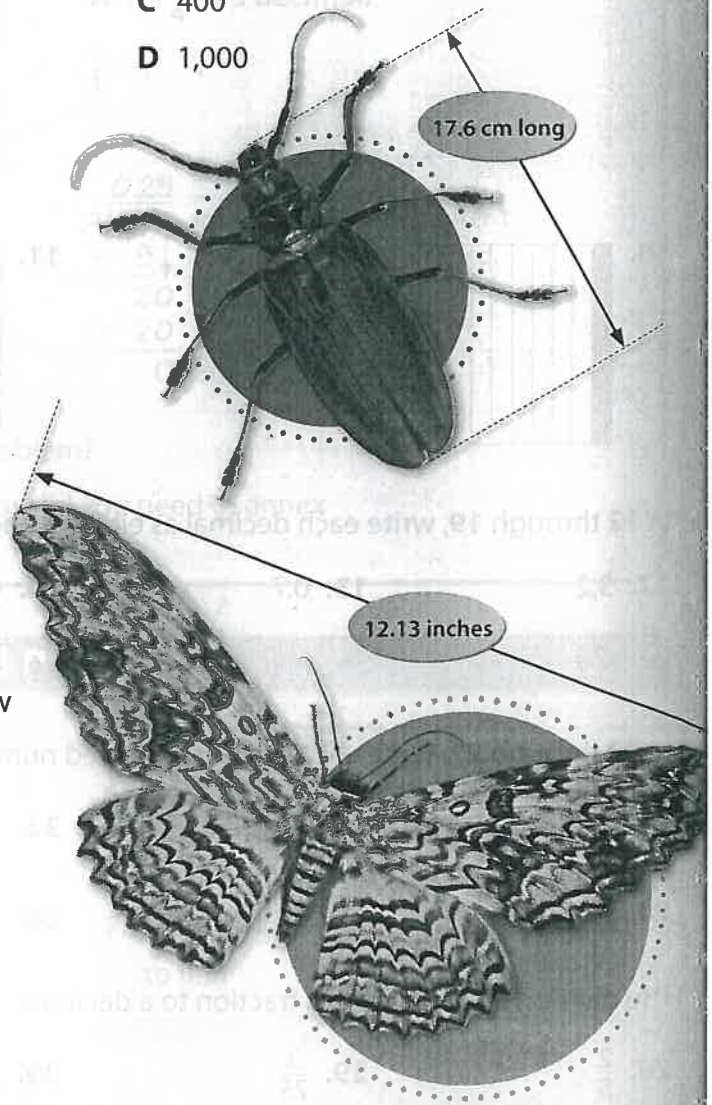
C 400

D 1,000

38. *Titanus giganteus* is one of the largest known beetles on Earth.

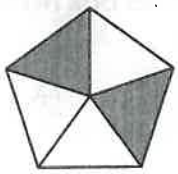
a How long is *Titanus giganteus* as a mixed number?

b How long is *Titanus giganteus* as an improper fraction?



39. The Great Owlet Moth of Brazil has a wingspan of 12.13 inches. Write this number as a mixed number.

40. **Think About the Process** A design is divided into 5 equal parts and $\frac{2}{5}$ are shaded. How would you change $\frac{2}{5}$ to a decimal?



A Divide 2 by 5.

B Divide 5 by 2.

C Multiply 2 by 5.

D Add 2 and 5.

Name _____

Daily Spiral Review
9-8

1. A group of 36 students goes on a school field trip. Of all the students on the trip, 18 are in third grade. What is $\frac{18}{36}$ in simplest form?

   A $\frac{1}{3}$

   B $\frac{4}{12}$

   C $\frac{8}{24}$

   D $\frac{1}{2}$

2. Conor feeds his cats a total of 9 ounces of food each day. How many days will 414 ounces of food last?

   A 21 days

   B 27 days

   C 46 days

   D 49 days

3. In the year 2000, there were 1,631,192 Texans between 10 and 14 years old. What is the value of the digit in the ten-thousands place in 1,631,192?

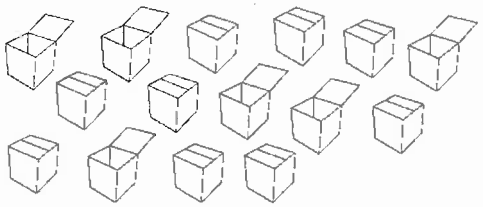
   A Ten thousand

   B Sixty thousand

   C Thirty thousand

   D Ninety thousand

4. What fraction of these boxes are open? Write your answer in simplest form.



$\frac{2}{5}$

5. Mr. Lou gets 385 free minutes each month on his cell phone plan. How many free minutes does Mr. Lou get in 7 months?

2,695 minutes

6. The table shows the total cost of large packages of blank CDs.

Number of Packages	4	6	7	9
Total Cost	$44	$66	$77	?

Describe how to find the cost of 9 large packages of blank CDs.

Multiply 11 by 9 to get $99.

Daily Spiral Review 9-8

Problem of the Day 9-8

Order the following money amounts from least to greatest: $\frac{1}{2}$ of a dime, $\frac{1}{4}$ of a dollar, $\frac{4}{5}$ of a quarter, and $\frac{4}{5}$ of a nickel.

$\frac{4}{5}$ nickel, $\frac{1}{2}$ dime, $\frac{4}{5}$ quarter, $\frac{1}{4}$ dollar

Problem of the Day 9-8

Name _____

Quick Check
9-8

1. What is $5\frac{8}{100}$ as a decimal?

   A 5.008

   B 5.08

   C 5.8

   D 58

2. Anna finished 0.75 of her homework. What is 0.75 as a fraction?

   A $\frac{7}{10}$

   B $\frac{75}{10}$

   C $\frac{75}{100}$

   D $\frac{750}{100}$

3. Hunji spent $2\frac{4}{10}$ hours on a project for a science fair. What is $2\frac{4}{10}$ as a decimal?

   A 24

   B 2.4

   C 2.04

   D 2.004

4. **Writing to Explain** Owen is 147.3 cm tall. What is Owen's height as a mixed number? What is Owen's height as an improper fraction? Explain how you solved the problem.

See student samples at the right.

.3 = $\frac{3}{10}$ so 147.3 = $147\frac{3}{10}$ cm

(10 × 147) + 3 = 1473 improper = $\frac{1473}{10}$ cm

Quick Check 9-8