

9-1 Finding Fractional Parts of a Number

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1 Getting Started

Objective

- To review finding fractions of a number

Materials

12 counters; overhead projector

Warm Up • Mental Math

Have students reduce each fraction to lowest terms.

- $\frac{4}{6}$ ($\frac{2}{3}$)
- $\frac{5}{10}$ ($\frac{1}{2}$)
- $\frac{1}{5}$ (in lowest terms)
- $\frac{6}{8}$ ($\frac{3}{4}$)
- $\frac{2}{8}$ ($\frac{1}{4}$)

Warm Up • Pencil and Paper

Remind students how to find a fraction of a whole number. Ask a student to find one-third of nine apples. (**3 apples**; $\frac{1}{3} \times 9 = 3$) Have them find the fractional part of each number.

- $\frac{1}{5}$ of 10 (**2**)
- $\frac{1}{2}$ of 12 (**6**)
- $\frac{1}{2}$ of 5 (**$2\frac{1}{2}$**)
- $\frac{1}{3}$ of 12 (**4**)
- $\frac{1}{4}$ of 8 (**2**)
- $\frac{1}{4}$ of 12 (**3**)

2 Teach

Introduce the Lesson Read the problem aloud, and have a student read and complete the information sentences. Remind students that to find a fraction of a number, they must multiply the fraction by the number.

- Explain that when they multiply by a fraction, they divide by the denominator then multiply by the numerator. They find the number of fractional units in the number when they divide by the denominator, and find the total number of these parts when they multiply by the numerator.
- Work the problem on the board while students follow in their texts.
- Draw the dot array on the board and have a student circle thirds. Have another count the number of dots in two-thirds. (**32**)

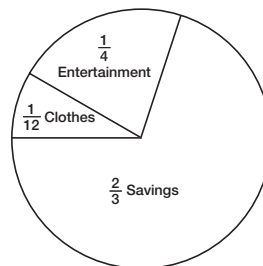
Name _____

Multiply and Divide Fractions

Lesson 9-1

Finding Fractional Parts of a Number

Ysidra tries to save as much money as she can for her college expenses. She earns \$48 each week tutoring history students at the campus learning center. How much does she save each week?



We want to find the amount Ysidra saves each week.

We know Ysidra earns \$48 each week. She saves $\frac{2}{3}$ of her earnings. We need to find $\frac{2}{3}$ of \$48.

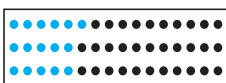
First, we divide the number by the denominator, 3.

$$\frac{1}{3} \text{ of } 48 = \frac{16}{3}$$

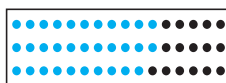
Then we multiply the quotient by the numerator, 2.

$$\frac{2}{3} \text{ of } 48 = 2 \times 16 = \underline{32}$$

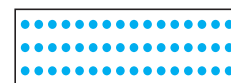
We can draw a picture to help us understand this.



$$\frac{1}{3} \text{ of } 48 = 16$$



$$\frac{2}{3} \text{ of } 48 = 32$$



$$\frac{3}{3} \text{ of } 48 = 48$$

REMEMBER To find a fraction of a number, divide the number by the denominator and multiply that result by the numerator.

Ysidra saves \$32 each week.

Getting Started

Write the number for each fractional part.

- $\frac{1}{8}$ of 16 = **2**
- $\frac{1}{10}$ of \$100 = **\$10**
- $\frac{1}{12}$ of 96 = **8**

Copy and solve.

- $\frac{3}{4}$ of 24 **18**
- $\frac{5}{6}$ of 96 **80**
- $\frac{9}{16}$ of \$288 **\$162**

Lesson 9-1 • Finding Fractional Parts of a Number

Read the solution sentence aloud. (**saves \$32 each week**)

Note: This method works best when the denominator of the fraction is a multiple of the whole number.

Develop Skills and Concepts Place 12 counters on the overhead projector.

- Ask a student to find $\frac{1}{4}$ of the counters. (**3**) Separate the counters into four groups. Write on the board: $12 \div 4 = 3$, $3 \times 1 = 3$ and $\frac{1}{4} \times 12 = 3$.
- Have another student find $\frac{2}{4}$ of the counters. (**6**) Write on the board: $\frac{2}{4} \times 12 = (12 \div 4) \times 2 = 3 \times 2 = 6$.
- Ask a student to calculate $\frac{3}{4}$ of 12 without using the counters. (**9**)

Have the class find $\frac{3}{5}$ of 25. (**15**)

Practice

Write the number for each fractional part.

- $\frac{1}{3}$ of 21 = 7
- $\frac{1}{2}$ of 24 = 12
- $\frac{4}{7}$ of \$84 = \$48
- $\frac{5}{6}$ of 36 = 30
- $\frac{3}{4}$ of 36 = 27
- $\frac{3}{8}$ of 64 = 24
- $\frac{4}{5}$ of \$35 = \$28
- $\frac{2}{3}$ of 21 = 14
- $\frac{1}{12}$ of 24 = 2
- $\frac{1}{7}$ of \$49 = \$7
- $\frac{3}{10}$ of 40 = 12
- $\frac{7}{8}$ of 56 = 49

Copy and do.

- $\frac{2}{3}$ of 42 = 28
- $\frac{1}{8}$ of 80 = 10
- $\frac{3}{7}$ of 84 = 36
- $\frac{4}{5}$ of 75 = 60
- $\frac{1}{12}$ of \$48 = \$4
- $\frac{1}{16}$ of 608 = 38
- $\frac{1}{2}$ of 806 = 403
- $\frac{3}{8}$ of \$496 = \$186
- $\frac{3}{4}$ of 948 = 711
- $\frac{3}{5}$ of \$1,080 = \$648
- $\frac{3}{16}$ of 1,792 = 336
- $\frac{7}{15}$ of 1,905 = 889

Problem Solving

Solve each problem.

- Winston bought $\frac{1}{2}$ dozen macaroni and cheese dinners. If he eats one dinner each day, how many days will his supply of dinners last?
6 days
- Jessica bought a package of 36 paper napkins for her party. She used $\frac{2}{3}$ of the napkins. How many were left in the package?
12 napkins
- It took Dean $\frac{3}{5}$ of an hour to walk home from basketball practice. How many minutes did it take?
36 minutes
- Tina has to sell 144 tickets to the student and faculty volleyball game. On Monday, she sold $\frac{3}{8}$ of the tickets. On Tuesday, she sold $\frac{1}{6}$ of the original number of tickets. How many did Tina have left to sell on Wednesday?
66 tickets

Use the ad to solve Problems 29 and 30.

- What is the sale price of a coat that usually sells for \$87?
\$29
- A pair of shoes costs \$72 and a jacket costs \$116. How much is saved if Paul buys the shoes and jacket on sale?
\$94

Sale	
Coats	$\frac{2}{3}$ off
Shoes	$\frac{1}{2}$ off
Jackets	$\frac{3}{4}$ off

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For Mixed Abilities

Common Errors • Intervention

Some students may forget to multiply by the numerator when finding the fraction of a number. Have them rewrite a problem, such as $\frac{2}{3}$ of 24, with the whole number written as a fraction. Then, they can multiply the numerators and denominators as they do when multiplying fractions.

$$\frac{2}{3} \text{ of } 24 = \frac{2}{3} \times \frac{24}{1} = \frac{48}{3}, \text{ or } 16$$

Enrichment • Number Sense

Show students that they can simplify the multiplication of fractions by removing common factors from numerator and denominator. This is usually called cancelling, and is equivalent to dividing by 1. Use this example:

$$\frac{5}{6} \times \frac{\overset{2}{\cancel{12}}}{\underset{1}{\cancel{1}}} = \frac{10}{1} = 10$$

Explain that a 6 has been taken from both numerator and denominator. Have students use this method to do these problems:

- $\frac{3}{8} \times 12 = \frac{9}{2} = 4 \frac{1}{2}$
- $\frac{3}{10} \times 20 = \frac{6}{1} = 6$
- $\frac{1}{12} \times 9 = \frac{3}{4}$

3 Practice

Have students complete all the exercises. Remind them of the two steps in finding a fraction of a number: Divide by the denominator, then multiply by the numerator.

4 Assess

Ask students how they could use $\frac{1}{5}$ of 20 to find $\frac{3}{5}$ of 20? (Possible answer: since $\frac{1}{5}$ of 20 is 4, $\frac{3}{5}$ of 20 is 3×4 or 12.)

5 Mixed Review

- $71 - 43\frac{9}{10}$ ($27\frac{1}{10}$)
- $\$17.95 + \$21.76 + \$108.95$ ($\$148.66$)
- $68,603 \div 76$ ($902 \text{ R}51$)
- $95 \times 1,906$ ($181,070$)
- $15\frac{3}{7} + 21\frac{2}{3}$ ($37\frac{2}{21}$)
- $8 \times 43,901$ ($351,208$)
- $\frac{9}{10} = \frac{?}{40}$ (36)
- 300×800 ($240,000$)
- $\$650.01 - \438.28 ($\$211.73$)
- $16\frac{1}{5} - 9\frac{3}{4}$ ($6\frac{9}{20}$)