### 2.7 Writing Decimals as fractions

ESSOntiad ausestion when you write a terminating decimal as a fraction, what type of denominator do you get?

## The Meaning of a Word - Terminate

When you terminate a phone call, you end the conversation.


A decimal that ends is called a terminating decimal. To convert a terminating decimal to a fraction, express the decimal in words.


## 1 ACTJVJIV: Writing Common Decimals as fractions

Work with a partner. Copy and complete the table.


| Decimal | Write as a Fraction | Simplify |
| :--- | :---: | :---: |
| 0.04 | Four hundredths $=\frac{4}{100}$ | $\frac{4}{100}=\frac{1 \cdot 4}{4 \cdot 25}=\frac{1 \cdot 4}{4 \cdot 25}=\frac{1}{25}$ |
| 0.125 | One hundred twenty-five <br> thousandths $=\frac{125}{1000}$ | $\frac{125}{1000}=\frac{1 \cdot 125}{8 \cdot 125}=\frac{1 \cdot 125}{8 \cdot 125}=\frac{1}{8}$ |
| 0.25 |  |  |
| 0.3 |  |  |
| 0.5 |  |  |
| 0.625 |  |  |
| 0.7 |  |  |
| 0.75 |  |  |
| 0.875 |  |  |

## 2 ACIIVIJY: 4 in a Row

## Number of Players: 2

Each player

- draws a 4 by 4 square (play card).
- fills the card with decimals or simplified fractions from Activity 1. (Don't show your play card to the other player.)
- takes turns calling out a fraction or decimal.


Both players cross out any number that is equal to the called out number.
The first person to get four numbers in the same row, column, or diagonal wins. Check each other's work.

## 3 ACJIVIJY: Vocabulary Patterns

Work with a partner. Match each word on the left with its description on the right.
Decimal
Originally the 10th month
Deciliter
December
A number system with base 10
Decennial
Celebration of a 10th anniversary
Decade
Ten years
One-tenth of a liter

## Inductive Reasoning

4. a. Make a list of all the denominators you found in Activity 1.
b. Factor each denominator into prime factors.
c. What similarities do you see in the denominators?
d. Relate your answer to the decimal system.
5. Describe a good strategy you could use to win the game in Activity 2.
6. What does the prefix "dec" mean?

## What Is Your Answer?

7. IN YOUR OWN WORDS When you write a terminating decimal as a fraction, what type of denominator do you get? complete Exercises 7-14 on page 88.

## Key Vocabulary

 terminating decimal, p. 84Every terminating decimal can be written as a fraction.

## $\therefore 0$ Key Idea

## Writing Decimals as Fractions

Words Write the digits of the decimal in the numerator. Use the place value of the last digit of the decimal to write the denominator.


## EXAMPLE (4) Writing Decimals as Fractions

a. Write 0.28 as a fraction in simplest form.

b. Write 0.475 as a fraction in simplest form.


## On Your Own

Write the decimal as a fraction in simplest form.

1. 0.9
2. 0.06
3. 0.52
4. 0.135

## EXAMPLE <br> 2 Writing Decimals as Mixed Numbers

Write 3.025 as a mixed number in simplest form.

$$
\begin{array}{rlrl}
3.025 & =3+0.025 & & \text { Write as a sum. } \\
& =3+\frac{25}{1000} & & \text { Write "twenty-five thousandths" as a fraction. } \\
& =3+\frac{255^{1}}{1000} & & \text { Simplify fraction. } \\
& =3 \frac{1}{40} & & \\
& & \text { Write as a mixed number. }
\end{array}
$$

## EXAMPLE <br> 3 Rea-Life Application

Two protected bird species are the whooping crane and the piping plover. How many times greater is the weight of a whooping crane than the weight of the piping plover?


Write each weight as a mixed number.
Whooping Crane: $246.25=246+0.25=246+\frac{25}{100}=246 \frac{1}{4}$
Piping Plover: $1 \frac{7}{8}$
Divide the weights.
Estimate $246 \div 2=123$
Whooping Crane 246.25 ounces

Piping Plover
$1 \frac{7}{8}$ ounces

$$
\begin{aligned}
246 \frac{1}{4} \div 1 \frac{7}{8} & =\frac{985}{4} \div \frac{15}{8} & & \text { Write as improper fractions. } \\
& =\frac{985}{4} \times \frac{8}{15} & & \text { Multiply by the reciprocal } \frac{8}{15} . \\
& =\frac{197}{1} \frac{985 \times 8^{2}}{4 \times 15}{ }_{3} & & \text { Divide out common factors. } \\
& =\frac{394}{3}, \text { or } 131 \frac{1}{3} & & \text { Simplify. }
\end{aligned}
$$

$\therefore$ : So, the weight of the whooping crane is $131 \frac{1}{3}$ times greater.
Reasonable? $131 \frac{1}{3} \approx 123$

## On Your Own

Exercises 19-22

Write the decimal as a mixed number in simplest form.
5. 1.7
6. 3.25
7. 6.34
8. 10.76
9. A wood stork weighs 81.9 ounces. How many times greater is the weight of a wood stork than the weight of the piping plover in Example 3?

## Vocabulary and Concept Check

1. OPEN-ENDED Find a decimal with a value between 0.25 and 0.5 . Write both the decimal and the equivalent fraction.
2. OPEN-ENDED Describe a real-life example where you write a decimal as a mixed number.

Fill in the blank to make the statement true.
3. $6.7=\frac{7}{10}$
4. $2.33=2 \xrightarrow{-33}$
5. $7.9=7 \frac{}{10}$
6. $1.622=1 \frac{622}{\square}$

## Practice and Problem Solving

Write the decimal as a fraction or mixed number in simplest form.
(1)
7. 0.9
8. 0.6
9. 0.4
10. 0.8
11. 0.64
12. 0.18
13. 0.375
14. 0.655
15. 0.11
16. 0.28
17. 0.435
18. 0.812
(2)
19. 2.75
20. 3.06
21. 8.113
22. 4.764
23. ERROR ANALYSIS Describe and correct the error in writing 0.073 as a fraction.

$$
\geqslant \quad 0.073=\frac{73}{100}
$$

24. CELL PHONE The thickness of a cell phone is 0.46 inch. Write the thickness as a fraction in simplest form.
25. MOVIE A movie is 2.3 hours long. Write the length of the movie as a mixed number in simplest form.
26. RUNNING A person runs 26.22 miles in a marathon. Write the number of miles as a mixed number in simplest form.

Write the decimal as an improper fraction in simplest form.
27. 7.2
28. 3.35
29. 6.82
30. 2.265
31. 4.75
32. 1.17
33. 5.52
34. 8.125

Write the value of the money as a decimal and as a fraction of a dollar.
35. one nickel
36. one quarter
37. eight pennies
38. one dollar and six dimes

Write the shaded part of the unit square as a decimal. Then write the decimal as a fraction.
39.

40.

41.

42. TRAFFIC JAM You are in a traffic jam that is $\frac{7}{8}$ mile long. The cars are in one lane bumper to bumper. The average length of a car is 0.003 mile. About how many cars are in the traffic jam?

43. Z00 The sign shows the distances to several zoo exhibits.
a. Write the distances as fractions.
b. How many times farther is the elephant exhibit than the monkey exhibit?
c. The manatee exhibit is 3 times farther than the tiger exhibit. How far is the manatee exhibit?
44. 绍easoningek A basketball player's 3-point average is the number of 3 -point shots made divided by the number of attempts.
a. A player's 3 -point average is 0.36 . How could this happen?
b. If the player in part (a) attempted 350 shots, how many shots did the player make?

Fair Game Review what you learned in previous grades \& lessons
Divide.
SKILLS REVIEW HANDBOOK
45. $30 \div 6$
46. $64 \div 4$
47. $85 \div 5$
48. $81 \div 9$

Divide. Write the answer in simplest form.

## SECTION 2.5

49. $\frac{1}{7} \div \frac{1}{5}$
50. $\frac{6}{11} \div \frac{1}{3}$
51. MULTIPLE CHOICE What is the area of the triangle?
SECTION 1.5
(A) $15 \mathrm{ft}^{2}$
(B) $27 \mathrm{ft}^{2}$
(C) $54 \mathrm{ft}^{2}$
(D) $90 \mathrm{ft}^{2}$
52. $\frac{1}{6} \div \frac{7}{12}$
53. $\frac{8}{15} \div \frac{18}{25}$

