Lesson 3

Percents and Decimals

Real-World Link

Watch

School A recent survey tells the favorite subjects of students at Martin Middle School.

Math: 28%	Science: 21%	Social Studies: 15%
Art: 16%	English: 13%	Other: 7%

1. Write a fraction with a denominator of 100 to represent the percent for each subject.

Math: $\frac{\square}{100}$ **Science:** $\frac{\square}{100}$

Art: $\frac{\square}{100}$ **Social Studies:** $\frac{\square}{100}$

English: $\frac{\square}{100}$ **Other:** $\frac{\square}{100}$

2. Write each fraction from Exercise 1 as a decimal.

Math: ☐ **Science:** ☐

Art: ☐ **Social Studies:** ☐

English: ☐ **Other:** ☐

3. MP **Make a Conjecture** Look back at Exercise 2. Compare the decimals to the percents. Explain how to write a percent as a decimal. _____

_____

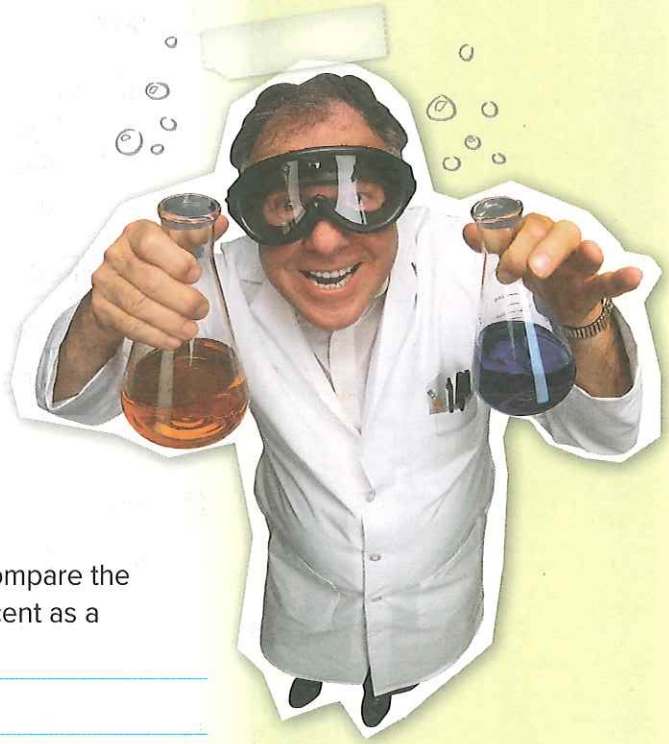
Essential Question

WHEN is it better to use a fraction, a decimal, or a percent?

Common Core State Standards

Content Standards
Preparation for 6.RP.3c

MP **Mathematical Practices**
1, 3, 4, 5, 6



Which MP Mathematical Practices did you use? Shade the circle(s) that applies.

① Persevere with Problems	⑤ Use Math Tools
② Reason Abstractly	⑥ Attend to Precision
③ Construct an Argument	⑦ Make Use of Structure
④ Model with Mathematics	⑧ Use Repeated Reasoning

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Key Concept

Write Percents as Decimals

Words To write a percent as a decimal, divide by 100 and remove the % sign. This is the same as moving the decimal point two places to the left.

Example
$$48\% = 48\%$$
$$= 0.48$$

Work Zone

Another way to write a fraction as a decimal is to write the percent as a fraction. Then write the fraction as a decimal.

Examples

Tutor

Write each percent as a decimal.

1. 56%

Method 1 **Write the percent as a fraction.**

$56\% = \frac{56}{100}$ Rewrite the percent as a fraction with a denominator of 100.

$= 0.56$ Write *56 hundredths* as a decimal.

Method 2 **Move the decimal point.**

$56\% = 56\%$ Move the decimal point two places to the left.

$= 0.56$ Remove the percent sign.

2. 8%

$8\% = \frac{8}{100}$ Rewrite the percent as a fraction with a denominator of 100.

$= 0.08$ Write *8 hundredths* as a decimal.

3. 2%

$2\% = 02\%$ Move the decimal point two places to the left.

$= 0.02$ Remove the percent sign.

Show your work.

a. _____

b. _____

c. _____

Got it? **Do these problems to find out.**

a. 32% **b.** 6% **c.** 93%

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Write Decimals as Percents

Key Concept

Words To write a decimal as a percent, multiply by 100 and add a % sign. This is the same as moving the decimal point two places to the right.

Example $0.36 = 0.36\%$
$= 36\%$

Another way to write a decimal as a percent is to write the decimal as a fraction with a denominator of 100. Then write the fraction as a percent.

STOP and Reflect

Why does it help to write a decimal as a fraction with a denominator of 100 when writing decimals as percents?

Examples

Tutor

4. **Write 0.38 as a percent.**

Method 1 **Write the decimal as a percent.**

$0.38 = \frac{38}{100}$ Write *38 hundredths* as a fraction.

$= 38\%$ Write the fraction as a percent.

Method 2 **Move the decimal point.**

$0.38 = 0.38$ Move the decimal point two places to the right.

$= 38\%$ Add the percent sign.

5. **Write 0.2 as a percent.**

$0.2 = \frac{2}{10}$ Write *2 tenths* as a fraction.

$\frac{2}{10} = \frac{20}{100}$ (×10 above and below) Write the equivalent fraction with a denominator of 100.

$= 20\%$ Write the fraction as a percent.

Got it? **Do these problems to find out.**

Write each decimal as a percent.

d. 0.47 **e.** 0.73 **f.** 0.5

Show your work.

d. _____

e. _____

f. _____

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Example

6. **The United States produces more corn than any other country, producing 0.4 of the total corn crops. Write 0.4 as a percent.**

$0.4 = 0.40$ Annex a zero.

$= 0.40\%$ Multiply by 100 and add a % sign.

$= 40\%$ Simplify.

Check $0.4 = \frac{40}{100}$ Write the decimal as a fraction with a denominator of 100.

$= 40\%$ ✓ Write the fraction as a percent.

Guided Practice

Write each percent as a decimal. (Examples 1–3)

1. 27% = _____

Show your work.

2. 15% = _____

3. 4% = _____

Write each decimal as a percent. (Examples 4 and 5)

4. 0.3 = _____

5. 0.82 = _____

6. 0.51 = _____

7. STEM About 0.7 of the human body is water. What percent is equivalent to 0.7? (Example 6) _____

8. **Building on the Essential Question** What is the relationship between percents and decimals?

_____

_____

_____

Rate Yourself!

How well do you understand percents and decimals? Circle the image that applies.

Clear | Somewhat Clear | Not So Clear

For more help, go online to access a Personal Tutor.

FOLDABLES Time to update your Foldable!

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Name _____ My Homework _____

Independent Practice

Go online for Step-by-Step Solutions eHelp

Write each percent as a decimal. (Examples 1–3)

1. 35% = _____

Show your work.

2. 2% = _____

3. 31% = _____

4. 95% = _____

Write each decimal as a percent. (Examples 4 and 5)

5. 0.22 = _____

6. 0.79 = _____

7. 0.1 = _____

8. 0.16 = _____

9. **Financial Literacy** A bank offers an interest rate of 4% on a savings account. Write 4% as a decimal. (Examples 1–3)

_____

10. When making a peanut butter and jelly sandwich, 96% of people put the peanut butter on first. Write 96% as a decimal. (Examples 1–3)

_____

11. In a recent year, 0.12 of Americans downloaded a podcast from the Internet. What percent is equivalent to 0.12? (Example 6) _____

12. In a recent year, the number of homes with digital cameras grew 0.44 from the previous year. Write 0.44 as a percent. (Example 6)

_____

13. **Financial Literacy** The formula $I = prt$ gives the simple interest I earned on an account where an amount p is deposited at an interest rate r for a certain number of years t. Use the table to order the accounts from least to greatest interest earned after 5 years.

_____

_____

Accounts at First Savings Bank		
Account	p ($)	r (%)
A	350	4
B	500	3.5
C	280	4.25

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14. MP **Persevere with Problems** Daphne wants to buy a coat that costs $80. The store that sells the coat has multiple locations. The sales tax in each county is shown in the table. How much more would the coat cost in Delaware county than Fairfield county?

County	Tax Rate (%)
Delaware	7.25
Fairfield	6.5
Franklin	6.75

15. Dante took three tests on Friday. He got a 92% on his English test, an 88% on his math test and a 90% on his science test. Write each percent as a decimal in order from least to greatest.

H.O.T. Problems Higher Order Thinking

16. MP **Reason Inductively** Write a decimal between 0.5 and 0.75. Then write it as a fraction in simplest form and as a percent.

17. MP **Persevere with Problems** How would you write $43\frac{3}{4}\%$ as a decimal?

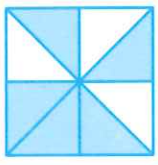
18. MP **Model with Mathematics** Write a percent between 25% and 50%. Then write it as a decimal and as a fraction in simplest form.

19. MP **Reason Inductively** Explain why percents are rational numbers.

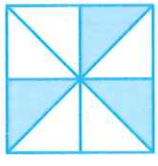
20. MP **Model with Mathematics** Write a problem about a real-world situation in which you would either write a percent as a decimal or write a decimal as a percent.

21. MP **Reason Abstractly** Each square below is divided into sections of equal size. In which square is 25% of the square *not* shaded?

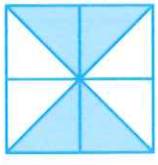
Square A



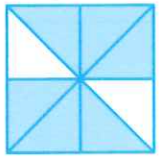
Square B



Square C



Square D



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Name _____ My Homework _____

Extra Practice

Write each percent as a decimal.

22. 17% = 0.17

$17\% = \frac{17}{100}$

$= 0.17$

Homework Help

23. 3% = _____

24. 1% = _____

25. 11% = _____

Write each decimal as a percent.

26. 0.99 = _____

27. 0.62 = _____

28. 0.6 = _____

29. 0.87 = _____

30. In one day at a store, 7% of the sales were from shoes. Write 7% as a decimal.

_____

31. In one hour on a certain street, 65% of the cars that passed were black. Write 65% as a decimal.

_____

32. In a recent year, 0.57 of those registered to vote in the United States voted in an election. Write 0.57 as a percent.

_____

33. In a recent study, 0.82 of Americans own a cell phone. What percent is equivalent to 0.82?

_____

34. MP **Be Precise** In the United States, sales tax is added to items that you purchase. The rate of sales tax varies by state and sometimes by county or region. Use the table to order the counties from least to greatest sales tax.

_____

_____

County Sales Tax	
County	**Sales Tax**
A	6.75%
B	0.0625
C	$\frac{7}{100}$

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Power Up! Common Core Test Practice

35. At baseball practice, Neil caught 16 out of 20 hits to the outfield. Select all the ways of expressing 16 out of 20.

- ☐ $\frac{3}{5}$
- ☐ 0.8
- ☐ 80%
- ☐ 0.08

36. The Ling family wants to purchase a television that costs $449. The store that sells the television has multiple locations in different counties. The sales tax for each county is shown. Complete the table below by arranging the counties from least to greatest sales tax rate. Write each sales tax as a percent.

County	Tax Rate
Cuyahoga	$7\frac{3}{4}\%$
Geauga	$\frac{13}{200}$
Lake	0.0675

	County	Sales Tax Rate (%)
Least		
Greatest		

Common Core Spiral Review

Fill in each ◯ with <, >, or = to make a true statement. 5.NBT.3b

37. 2.50 ◯ 2.5

38. 0.006 ◯ 0.1

39. 0.015 ◯ 0.005

40. The table shows results for the 100 meter sprint. Who had the fastest time? 5.NBT.3b

Athlete	Time (s)
Bryson	12.14
Malik	11.84
Marcell	11.94
Wyatt	12.44

41. Aliah ate 0.75 sandwich. Her brother ate 1.5 sandwiches. Who ate more? 5.NBT.3b

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