Number Worlds®

Accelerate Math Success

Mc Graw Hill Education

Lesson 1

Find the Math

Many games involve finding matching pictures or numbers. Sometimes the matches are exactly the same. Other times, the matches are the same picture or number but in a different form.

PHOTO: McGraw-Hill Education

1. In a matching game, one card shows the word *rectangle*. What could its matching card show?

_____

_____

2. In a matching game, one card shows the number 10. What could its matching card show?

_____

_____

3. In a matching game, you pick two cards. One card shows the number 125. The other card shows 100 + 20 + 5. Did you find a match? Explain.

_____

_____

Lesson 1

Key Idea

You can use a place-value chart to write whole numbers in expanded form. **Expanded form** is a way to write a number as the sum of the values of each digit.

Standard form: 9,354

thousands	hundreds	tens	ones
9	3	5	4

Expanded form: 9,000 + 300 + 50 + 4

Try This

Choose a number in the box to answer each question.

564	**3,301**	**6,067**	**4,250**	**7,142**

1. Which number has the same number of tens as thousands?

_____

2. Which number does not have any tens?

_____

3. In which number does the 4 stand for 40?

_____

4. Which number has 5 hundreds?

_____

5. In which number does the 2 stand for 200?

_____

6. Which number has the greatest digit in the hundreds place?

_____

Practice

Write each number in expanded form.

7. 2,130 _____

8. 85 _____

9. 731 _____

10. 1,504 _____

11. 8,390 _____

12. 3,067 _____

Write each number in standard form.

13. 200 + 8 _____

14. 4,000 + 1 _____

15. 3,000 + 60 + 5 _____

16. 7,000 + 100 + 80 + 7 _____

Write the value of each underlined digit.

17. 2,9<u>6</u>5 _____

18. <u>1</u>0,000 _____

19. <u>7</u>,403 _____

20. 1,96<u>5</u> _____

Reflect

Are the expanded forms for two numbers with the same digits always the same? Explain and give an example.

_____

_____

_____

Lesson 2

Key Idea

You can follow these steps to write any decimal as a fraction.

Step 1: Identify the place value of the last digit.

thousands	hundreds	tens	ones	.	tenths	hundredths	thousandths
			0	.	7	8	2

Last digit = thousandths = $\frac{1}{1{,}000}$

Step 2: Write the decimal digits as the numerator. Write the place value of the last digit as the denominator.

$0.782 = \frac{782}{1{,}000}$ ← numerator ← denominator

Standard form: 0.782

Fraction form: $\frac{782}{1{,}000}$

Word form: seven hundred eighty-two thousandths

Try This

Write each decimal as a fraction, and write the name of the decimal in word form. The first one is done for you.

1. 0.244 $\frac{244}{1{,}000}$; two hundred forty-four thousandths

2. 0.65 _____; _____

3. 0.003 _____; _____

4. 0.8 _____; _____

5. 0.045 _____; _____

6. 0.781 _____; _____

Practice

Complete the missing parts of the chart below.

	Decimal	Fraction	Word Form
7.	0.042	$\frac{42}{1,000}$	_____
8.		$\frac{12}{100}$	twelve hundredths
9.	0.007		_____
10.			fifteen thousandths
11.		$\frac{9}{10}$	_____
12.			three hundred four thousandths
13.	0.061		_____
14.			forty-seven hundredths
15.		$\frac{508}{1,000}$	_____

Reflect

How do you know what denominator to use when you write a decimal as a fraction?

_____

_____

_____

Lesson 3

Key Idea

You can use a place-value chart to write decimals in expanded form.

thousands	hundreds	tens	ones	.	tenths	hundredths	thousandths
			0	.	6	1	4

First, write the decimal as a fraction. Make the place value of the last digit the denominator. Then expand that fraction.

$$0.614 = \frac{614}{1{,}000} = \frac{600}{1{,}000} + \frac{10}{1{,}000} + \frac{4}{1{,}000} = \frac{6}{10} + \frac{1}{100} + \frac{4}{1{,}000}$$

Try This

Write each decimal as a fraction.

1. 0.42 _____

2. 0.079 _____

3. 0.396 _____

4. 0.403 _____

Write the numerator in each fraction to show how to expand the decimal.

5. $0.632 = \frac{632}{1{,}000} = \frac{\square}{1{,}000} + \frac{\square}{1{,}000} + \frac{\square}{1{,}000}$

6. $0.632 = \frac{}{1{,}000} = \frac{\square}{10} + \frac{\square}{100} + \frac{\square}{1{,}000}$

Practice

Complete the chart. The first one is done for you.

	Decimal	Fraction	Expand using the sum of values of each digit in the numerator.	Expand using the sum of values of each digit in the decimal.
7.	0.751	$\frac{751}{1{,}000}$	$\frac{700}{1{,}000} + \frac{50}{1{,}000} + \frac{1}{1{,}000}$	$\frac{7}{10} + \frac{5}{100} + \frac{1}{1{,}000}$
8.		$\frac{\square}{\square}$	$\frac{500}{1{,}000} + \frac{40}{1{,}000} + \frac{6}{1{,}000}$	$\frac{\square}{10} + \frac{4}{\square} + \frac{6}{1{,}000}$
9.		$\frac{24}{1{,}000}$	$\frac{\square}{1{,}000} + \frac{4}{1{,}000}$	$\frac{2}{100} + \frac{4}{1{,}000}$
10.	0.403	$\frac{\square}{1{,}000}$	$\frac{\square}{1{,}000} + \frac{3}{\square}$	$\frac{\square}{\square} + \frac{\square}{\square}$
11.	0.296	$\frac{296}{1{,}000}$	$\frac{200}{\square} + \frac{\square}{\square} + \frac{\square}{\square}$	$\frac{\square}{\square} + \frac{\square}{\square} + \frac{6}{1{,}000}$
12.	0.019	$\frac{19}{1{,}000}$	$\frac{\square}{1{,}000} + \frac{9}{\square}$	$\frac{1}{\square} + \frac{\square}{\square}$

Reflect

Is the expanded form of a decimal in the thousandths always going to have three fractions in the expanded form? Why or why not? Give an example to support your reasoning.

Lesson 4

Key Idea

You can use place value to write decimals greater than 1 in different expanded forms.

Standard form: 236.475

thousands	hundreds	tens	ones	.	tenths	hundredths	thousandths
	2	3	6	.	4	7	5

Expanded form 1: $200 + 30 + 6 + \frac{475}{1{,}000}$

Expanded form 2: $200 + 30 + 6 + \frac{400}{1{,}000} + \frac{70}{1{,}000} + \frac{5}{1{,}000}$

Expanded form 3: $200 + 30 + 6 + \frac{4}{10} + \frac{7}{100} + \frac{5}{1{,}000}$

Try This

Fill in the missing numbers in each expanded form. The first one is done for you.

1. $12.42 = 10 + 2 + \frac{42}{100}$

2. $6.204 = 6 + \frac{\square}{\square}$

3. $531.045 = \square + \square + 1 + \frac{\square}{1{,}000}$

4. $45.07 = 40 + \square + \frac{7}{\square}$

Fill in the missing numbers in each expanded form.

5. $6.498 = 6 + \frac{\square}{1{,}000} + \frac{\square}{1{,}000} + \frac{\square}{1{,}000}$

6. $6.498 = 6 + \frac{\square}{10} + \frac{9}{\square} + \frac{\square}{1{,}000}$

Practice

Write each decimal in three different expanded forms. The first one is done for you.

7. 19.059 =

Expanded Form 1: $10 + 9 + \frac{59}{1{,}000}$

Expanded Form 2: $10 + 9 + \frac{50}{1{,}000} + \frac{9}{1{,}000}$

Expanded Form 3: $10 + 9 + \frac{5}{100} + \frac{9}{1{,}000}$

8. 8.179 =

Expanded Form 1: _____

Expanded Form 2: _____

Expanded Form 3: _____

9. 820.403 =

Expanded Form 1: _____

Expanded Form 2: _____

Expanded Form 3: _____

10. 509.21 =

Expanded Form 1: _____

Expanded Form 2: _____

Expanded Form 3: _____

Reflect

When you write a decimal greater than 1 in three different expanded forms, what is the same in each form?

_____

_____

Lesson 5 Review

This week, you learned how to read, write, and expand different kinds of decimal numbers. You expanded decimals that were both less than 1 and greater than 1.

Lesson 1

Write the expanded form of each number.

1. 6,010 _____

2. 4,507 _____

3. 5,361 _____

Lesson 2

Write each decimal as a fraction and in word form.

4. 0.602 _____; _____

5. 0.037 _____; _____

6. 0.005 _____; _____

Lesson 3 **Complete** the chart.

	Decimal	Fraction	Expand using the sum of values of each digit in the numerator.	Expand using the sum of values of each digit in the decimal.
7.	0.812	$\frac{\square}{1{,}000}$	$\frac{\square}{1{,}000} + \frac{\square}{1{,}000} + \frac{\square}{\square}$	$\frac{8}{10} + \frac{\square}{\square} + \frac{\square}{1{,}000}$
8.		$\frac{\square}{\square}$	$\frac{600}{1{,}000} + \frac{30}{1{,}000} + \frac{2}{1{,}000}$	$\frac{\square}{10} + \frac{3}{\square} + \frac{\square}{1{,}000}$

Lesson 4 **Write** each number in three different expanded forms.

9. 372.541 =

Expanded Form 1: _____

Expanded Form 2: _____

Expanded Form 3: _____

10. 405.062 =

Expanded Form 1: _____

Expanded Form 2: _____

Expanded Form 3: _____

Reflect

Jenna says that the expanded form of 56.102 is $50 + 6 + \frac{1}{10} + \frac{2}{100}$. Is she correct? Explain why or why not.

_____

_____

_____

Project-Based Learning

Project
Math Match Game

Write the answer to each question on the line.

1. Pick three Number Cards. Write the numbers in any order in the blanks below.

0._____ _____ _____

2. Write the decimal number you wrote for Question 1 in expanded form.

_____.

3. Pick five Number Cards. Write the numbers in any order in the blanks below.

_____ _____._____ _____ _____

4. Write the decimal number you wrote for Question 3 in expanded form.

_____

5. Use the decimals and expanded forms to complete the equations:

_____ = _____

_____ = _____

Reflect

6. How did you expand your decimal number?

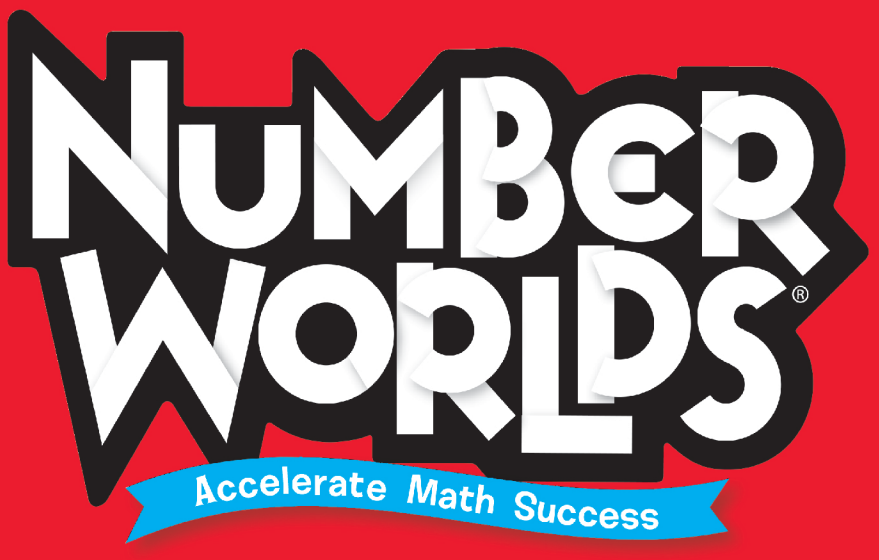
_____

_____

7. How could you check that your expanded forms are correct?

_____

_____



Student Workbook

Engage with your mathematics program!

PLAY interactive online games and activities.

SOLVE complex math problems with digital math tools.

COLLABORATE with classmates in project-based learning.

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