

FOCUS on

BUILDING
NUMBER SENSE



To the Student

In *FOCUS on Building Number Sense, Book H*, you will read problems and answer questions. You will practice using a math strategy called Building Number Sense. You will learn about the strategy on the Learn About pages. You will see a sample passage, sample questions, and sample answer choices on the Lesson Preview pages. Then you will practice using the strategy in twenty lessons.

Each lesson has a passage and five questions. After you finish reading the passage, answer the five questions. For the first four questions, fill in the correct answers on the Answer Form on page 53. Or, you may fill in the correct answers directly on the page. For the fifth question, show your work. Then write and explain your answer. Fill in the circle on the Answer Form to show that you have completed the fifth question.

Use the Tracking Chart on page 47 to show when you have finished each lesson and the number of questions that you answered correctly. After each group of five lessons, complete a self-assessment to see how you are doing.

So . . . FOCUS and enjoy!

Acknowledgments

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Learn About

Building Number Sense: Prime Numbers, Composite Numbers, and Exponents

A **prime number** is greater than 1 and has exactly two different factors, 1 and the number itself. The numbers 2, 3, 5, 7, and 11 are examples of prime numbers. The only factors of 2 are 2 and 1, the only factors of 3 are 3 and 1, and so on.

A **composite number** is greater than 1 and has more than two factors. The numbers 4, 6, 8, 9, and 10 are examples of composite numbers. The factors of 4 are 1, 2, and 4; the factors of 6 are 1, 2, 3, and 6; and so on.

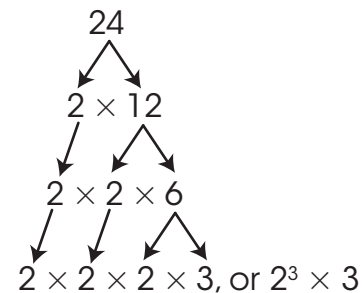
The number 1 is neither prime nor composite.

When a number is broken down into its prime factors, it is the number's **prime factorization**. The composite number 24 can be broken down into the prime factors 2 and 3.

Numbers can be expressed in exponential form. An **exponent** tells how many times the **base** is multiplied by itself.

$$8 = 2 \times 2 \times 2 = 2^3$$

The 2 is the base and the 3 is the exponent.



Devon used prime factorization to show how many days remain until he is able to take his driving test. In how many days will Devon be able to take his driving test?

$$2^3 \times 5^3$$

$$2 \times 2 \times 2 \times 5 \times 5 \times 5 = 1,000$$

Devon will be able to take his driving test in **1,000 days**.



A **prime number** is greater than 1 and has exactly two different factors, 1 and the number itself. A **composite number** is greater than 1 and has more than two factors. An **exponent** tells how many times the **base** is multiplied by itself.

Learn About

Building Number Sense: Order of Operations

When solving problems with multiple operations, certain operations must be completed before others.

To solve problems with square roots, first find the square root or roots.

Problem	Find the Square Roots	Simplify and Solve
$\sqrt{169} - \sqrt{25} = \square$	$\sqrt{169} = 13; \sqrt{25} = 5$	$13 - 5 = 8$

To solve problems with parentheses and exponents, first perform all operations within parentheses.

Problem	Do Operation in Parenthesis	Simplify and Solve
$(25 - 15)^3 = \square$	$25 - 15 = 10$	$(10)^3 = 10 \times 10 \times 10 = 1,000$

To solve a problem that has decimals, improper fractions, and mixed numbers, change all numbers to the same form.

Problem	Change to Fractions or Change to Decimals	Solve
$0.20 + 2\frac{1}{4} + \frac{13}{4} = \square$	$\frac{4}{20} + \frac{45}{20} + \frac{65}{20} = \square$ $0.20 + 2.25 + 3.25 = \square$	$\frac{4}{20} + \frac{45}{20} + \frac{65}{20} = \frac{114}{20} = 5\frac{7}{10}$ $0.20 + 2.25 + 3.25 = 5.7$

Paige needs to correctly simplify this expression to win the math tournament. What is the correct answer to this problem?

$$\sqrt{225} + (15 - 9)^2$$

$$\sqrt{225} + (15 - 9)^2$$

$$15 + (6)^2$$

$$15 + 36 = 51$$

The correct answer is **51**.



When solving problems with multiple operations, certain operations must be completed before others.

Lesson 20

Read the passage.
Then do Numbers 1–5.

Gym Special

Tara joined the local fitness gym. Her gym membership includes a personal trainer for the first 6 weeks. The trainer meets with the members three days a week. On the first day that they met, the trainer tested Tara's heart-rate level and physical strength. The trainer then worked with Tara to develop a personal fitness program designed to improve her overall health.



1. On the first day, Tara walked at a rate of 2.5 miles per hour for $\frac{1}{2}$ hour on the treadmill. Which expression is equal to 2.5?

- Ⓐ $3.5 - \frac{5}{4} + \frac{1}{2}$
- Ⓑ $1.7 + \frac{5}{4} - 0.45$
- Ⓒ $\frac{4}{2} + \sqrt{2.25}$
- Ⓓ $\sqrt{12.25} - \sqrt{2.25}$

2. Simplify the expression $(24 - 18)^2 - \frac{4}{4}$ to find the total number of crunches Tara was able to do on her first day.

- Ⓐ 11 crunches
- Ⓑ 15 crunches
- Ⓒ 25 crunches
- Ⓓ 35 crunches

3. Simplify the expression $\sqrt{2,025} + \sqrt{100}$ to find how much weight Tara was able to lift on the weight-lifting machine.

- Ⓐ 45 lb
- Ⓑ 55 lb
- Ⓒ 65 lb
- Ⓓ 75 lb

4. Simplify the expression $2 \times 3^2 \times 5$ to find how much weight Tara could push on the leg press machine.

- Ⓐ 60 lb
- Ⓑ 80 lb
- Ⓒ 90 lb
- Ⓓ 180 lb

5. After the first three weeks, the trainer tested Tara's heart-rate level again. She was now able to walk at a faster rate for $\frac{1}{2}$ hour. The expression $\frac{3}{5} + \frac{7}{7} - 0.25$ represents the increase in Tara's walking rate in miles per hour. By how many miles per hour did Tara increase her walking rate in the first three weeks? What was her walking rate in miles per hour at the end of the first three weeks? Show your work in the space below. Remember to check your solution.

Write your solution.

Explain how you found your solution.
