UNIT 1 · STANDARD 6.NS.4

Prime Factorization

Lesson 1-1

Name: Type your name **Date:** Today's date **Class:** Class period

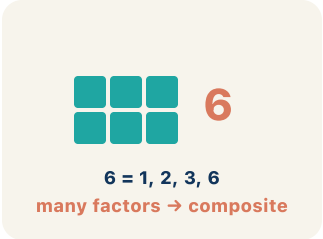
Key Vocabulary Level 2 Standard

Picture first, then the word, then a plain-language meaning. Say each word out loud.

7 has only two factors: 1 × 7. So 7 is prime.

Prime number

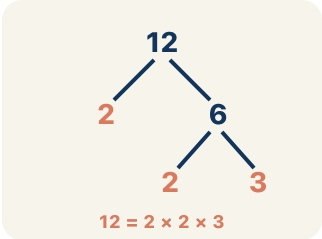
Write the definition:



12 = 1 × 12, 2 × 6, 3 × 4 — six factors, so 12 is composite

Composite number

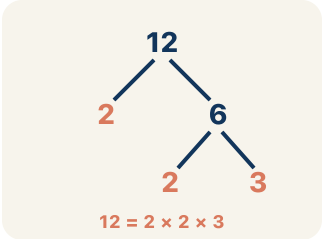
Write the definition:



36 = 2 × 2 × 3 × 3 = $2^2 \times 3^2$

Prime factorization

Write the definition:



24 → 4 × 6 → (2 × 2) × (2 × 3) → 2 × 2 × 2 × 3

Factor tree

Write the definition:

2^3 means 2 × 2 × 2 = 8

Exponent

Write the definition:

Guided Notes Level 2 Standard

🎯 **WHAT WE'RE LEARNING TODAY**

I can write a number as a product of its prime factors using a factor tree.

✏️ **Fill in each blank as we go. Use the Word Bank to help you.**

📚 **WORD BANK — FILL EACH BLANK WITH THE BEST WORD**

Prime number | Composite number | Prime factorization | Factor tree | Exponent

Tap any word to see what it means and a picture.

1 A whole number greater than 1 with exactly two factors, 1 and itself, is a _____ number.

2 A whole number greater than 1 that has more than two factors is a _____ number.

3 _____ — Writing a number as prime numbers multiplied together.

4 I can break a number into its prime factors step by step using a _____.

5 In 2^3, the small number 3 is the _____ and it shows 2 is multiplied 3 times.

🧱 Watch & Try — Worked Examples

See the notes in action: watch one worked all the way through, then try the next with the same steps.

👀 I do — watch

Follow each step as your teacher solves it.

Problem: Which of the following is a prime number?

A. 17

B. 15

C. 21

D. 9

Step 1 17 has exactly two factors: 1 and 17.

Step 2 15 = 3 × 5, 21 = 3 × 7, and 9 = 3 × 3, so they are all composite.

✅ **Answer:** A. 17

🧩 Try — put the steps in order

Drag the cards (or use the ▲▼ buttons) to put the solution steps in the right order, then press **Check**.

15 = 3 × 5, 21 = 3 × 7, and 9 = 3 × 3, so they are all composite.

17 has exactly two factors: 1 and 17.

🤝 We do — together

Solve this one with your class using the same steps.

Problem: What is the prime factorization of 30?

A. 2 × 3 × 5

B. 5 × 6

C. 2 × 15

D. 3 × 10

Step 1 _____

Step 2 _____

Answer: _____

✏️ **You do — your turn**

Now try one on your own. Show every step.

Problem: What is the prime factorization of 18?

A. 2 × 3 × 3

B. 2 × 9

C. 3 × 6

D. 6 × 3

Show your work:

Try It

Solve on your own. Check the answer key when you are done.

1. The second panel needs a number whose prime factorization is $2^2 \times 3^2$. Which number unlocks it?

A. 36

B. 24

C. 12

D. 18

Show your work:

2. The final lock asks for the prime factorization of 78 written as a product of primes. Which is correct?

A. $2 \times 3 \times 13$

B. 2×39

C. 3×26

D. 6×13

Show your work:

Stretch Your Thinking

Level 2 enrichment

Challenge task — explain your reasoning in full sentences.

Choose any two-digit composite number. Show TWO different factor trees that both lead to the same prime factorization. Explain why every composite number has only one prime factorization.

Sentence starter: I chose the number ____. My first factor tree starts with ____ × ____, and my second starts with ____ × ____. Both give the same prime factorization: ____. This happens because ____.

Show your work:

Reflect — Exit Ticket

What is the prime factorization of 40?

A. 2 × 2 × 2 × 5

B. 4 × 10

C. 5 × 8

D. 2 × 20

Your answer: