Prime Factorization — Homework

Lesson 6-13 • Standard 6.NOS.4

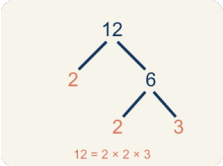
Name: _____ **Period:** _____ **Date:** _____

Today's Goals

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

Language: I can explain how I broke a number down using the words prime number, composite number, factor, and exponent.

Key Words



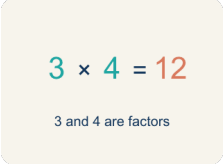
Prime Factorization (Factorización prima) — Writing a whole number as a product of only prime numbers.



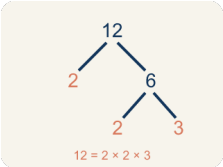
Prime number (Número primo) — A number bigger than 1 that you can only divide by 1 and itself.



Composite number (Número compuesto) — A number bigger than 1 that you can divide by more than just 1 and itself.



Factor (Factor) — A factor of a whole number divides it evenly, with no remainder. For example, 3 is a factor of 12 because 12 ÷ 3 = 4.



Factor tree (Árbol de factores) — A picture that splits a number into its prime numbers, step by step.



Exponent (Exponente) — A small number that tells how many times to multiply a number by itself.

Practice

Show your work. Use the blank space under each problem.

1. Which of the following is a prime number?

A. 9

B. 15
C. 17
D. 21

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2. What is the prime factorization of 30?

A. 2 × 3 × 5
B. 2 × 15
C. 3 × 10
D. 5 × 6

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3. Match each number to its prime factorization.

Item	Answer choices
____ 12	F. 2 × 5 × 5
____ 18	E. 3 × 3 × 5
____ 20	D. 2 × 2 × 7
____ 28	C. 2 × 2 × 5
____ 45	B. 2 × 3 × 3
____ 50	A. 2 × 2 × 3

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4. Build the factor tree. Write each number as a product of primes.

Number	First Split	Prime Factorization
24	4 × 6	
36	4 × 9	
40	5 × 8	
56	7 × 8	

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5. Sort each number: can it be expressed as a product of exactly TWO prime factors, or does it need THREE or more?

Groups: Product of Exactly Two Primes | Product of Three or More Primes

- 6 → _____
- 10 → _____
- 15 → _____
- 35 → _____
- 12 → _____
- 30 → _____
- 24 → _____
- 60 → _____

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6. Two students found different factor trees for 60. Student A started with 2 × 30. Student B started with 6 × 10. Which statement is true?

A. Only Student A gets the correct prime factorization
B. Only Student B gets the correct prime factorization
C. They will get different prime factorizations
D. Both get the same prime factorization: 2 × 2 × 3 × 5

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7. Spot the Common Mistake

Step 1 (Find the prime factorization of 45, using exponents): Start: 45
Step 2 (First split): 45 = 5 × 9
Step 3 (Break down 9): 9 = 3 × 3, so 45 = 5 × 3 × 3
Step 4 (Write with exponents): 45 = $3^2 \times 5^2$

Which step has the mistake? Explain and fix it:

_____

_____

_____

8. The first lock panel shows 90. What is the prime factorization of 90?

A. 2 × 3 × 3 × 5
B. 2 × 45
C. 3 × 30
D. 9 × 10

_____

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

A. 12
B. 18
C. 24
D. 36

_____

10. Sort the station ID numbers: drag each one into PRIME (only 1 and itself) or COMPOSITE (more than two factors) to clear the scanner.

Groups: Prime Numbers | Composite Numbers

- 19 → _____
- 37 → _____
- 41 → _____
- 63 → _____
- 44 → _____
- 99 → _____

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