

Picturing Prime Factorization – Class Handout

Using the sticky notes as “prime blocks”, illustrate the prime factorization of an integer by placing its prime factors next to each other. The operation of multiplication will be implicitly understood for blocks placed next to each other.

1. Illustrate the prime factorization of 12 and the divisors of 12 by using the prime blocks to fill in the table:

Prime Factors of a	$a \times b = 12$	Prime Factors of b
	1×12	$2 \times 2 \times 3$
	2×6	
	3×4	

2. Construct a similar table for all possible ways to factor 60 as a product of two positive integers and illustrate the prime factorization of each divisor of 60.

3. What do you notice about the relationships between the prime factorization of 60 and the prime factorizations of each of its divisors?
4. Find the prime factorizations of the numbers 420 and 4620, and illustrate their factorization using the prime blocks. Keep these factorizations on your workspace as you complete the next problem.
5. Which of the following integers is a factor of 420? Which is a factor of 4620? How do you know?
 - (a) 66
 - (b) 56
 - (c) 70
 - (d) $2 \times 3 \times 5 \times 5 \times 7$
6. For all integers a and n , if a is a divisor of n , what is the relationship between the prime factors of a and the prime factors of n ?