

## Factors and Multiples

Each whole number is made up of other numbers which are its **factors**. These numbers divide evenly into the number. For example, six can be divided by one, two, three, and six. There are a finite number of factors for each number.

**List** the factors of 6: 1, 2, 3, 6.

Each factor has a partner which forms the multiplication fact family for six.

Fact family for six:  $1 \times 6$     $6 \times 1$     $3 \times 2$     $2 \times 3$

Only some of the factors of six are prime numbers themselves. These are the **prime factors** of six. We can decompose, or break six down into its prime factorization, which will be the multiplication of a series of prime numbers that together equal six.

**Prime factorization** of six:       $6 = 2 \bullet 3$

Each whole number also has multiples of itself. This LIST of multiples is formed by multiplying six by the natural numbers, beginning with 1 ( $1 \times 6$ ,  $2 \times 6$ ,  $3 \times 6$ ,  $4 \times 6$ , and so forth). The list of multiples is infinitely long, so it will always end with "..."

**Multiples** of six:      6, 12, 18, 24, 30, ....

1. List the factors of 36: \_\_\_\_\_
2. Prime factor 36: \_\_\_\_\_
3. Observe the differences between factors and multiples of 16. The factors are always \_\_\_\_\_ than or equal to 16. The multiples are always \_\_\_\_\_ than or equal to 16.
4. How many ways are there to prime factor 9?