

## Equivalent Fractions and GCF

Fractions are used to represent parts of a whole. First, we'll examine how the whole number "1" may be expressed as a fraction.

Equivalent fractions represent the same fractional part. We'll use fraction bars to observe some equivalent fractions and how they look differently, but mean the same fractional part.

Reducing a fraction is finding an equivalent fraction in simplest form. A simplified fraction makes working with it easier.

Factors of a number are numbers multiplied together to get the number. One set of factors for six is  $2 \times 3$ . Another set of factors for six is  $1 \times 6$ . We will use factors to find greatest common factor (GCF).

Write fraction answers using the form in these examples.

Example 1: two-thirds is written as  $\frac{2}{3}$ .

Example 2: five and three fourths is written as  $5 \frac{3}{4}$ .

Fraction Bars and Equivalence to One

Equivalent Fractions and Reducing Fractions

GCF (Listing Factors)

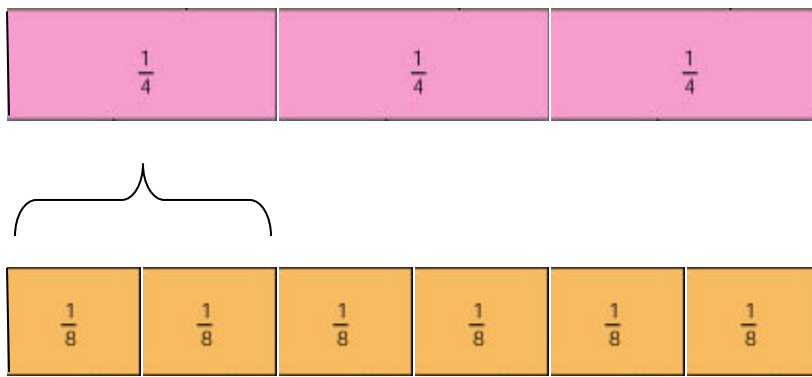


# Equivalent Fractions and Reducing Fractions

## Understanding Equivalent Fractions

Fractions that represent the same amount are called **equivalent** fractions.

Look at the fraction strips below which represent the quantity,  $\frac{3}{4}$ .



The quantity  $\frac{3}{4}$  can also be represented in 8ths. It takes two  $\frac{1}{8}$ 's to make  $\frac{1}{4}$ .

$$\text{There, } \frac{3}{4} = \frac{6}{8}$$

Another way to find equivalent fractions is by multiplying the numerator and denominator by the same number. (The numerator is the top number of a fraction. The denominator is the bottom number.)

$$\frac{3}{4} \times \frac{2}{2} = \frac{6}{8} \text{ which can be thought of as } \frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

This method is permitted because  $\frac{2}{2} = 1$  and when you multiply by 1 as a fraction you get the same number back with a different appearance.

The fraction strips above prove that  $\frac{3}{4} = \frac{6}{8}$  because they represent the same amount.

## Reducing Fractions

**Reducing a fraction** is finding an equivalent fraction that is in simplest form. Simplest form means that the only number that will divide into both the numerator and denominator is 1.

Reduce  $\frac{8}{12}$ .

Divide both the numerator and denominator by the same number.

$$\frac{8}{12} \div \frac{4}{4} = \frac{2}{3}.$$

## GCF (Listing Factors)

The **Greatest Common Factor (GCF)** of two numbers is the largest factor that is the same when all the factors in a number have been listed. Follow the steps in this example to find the GCF.

**Find the GCF of 18 and 24.**

**List all of the factors of 18.**

$$1 \times 18$$

$$2 \times 9$$

$$3 \times 6$$

**Write the factors in order from least to greatest.**

{1, 2, 3, 6, 9, 18}

**List all of the factors of 24.**

$$1 \times 24$$

$$2 \times 12$$

$$3 \times 8$$

$$4 \times 6$$

**Write the factors in order from least to greatest.**

{1, 2, 3, 4, 6, 8, 12, 24}

To find the GCF, look for the largest factor that is the same in both lists.

{1, 2, 3, 6, 9, 18}

{1, 2, 3, 4, 6, 8, 12, 24}

**The GCF is 6.**

**You may use the GCF to reduce fractions.**

Reduce  $\frac{18}{24}$  to simplest form.

The GCF is 6.

$$\frac{18}{24} \div \frac{6}{6} = \frac{3}{4}$$

