

Divisibility

Common Factors and Greatest Common Factors

Before you can reduce a fraction, you need to learn two new terms. The two new terms are: **Common Factors (CF)** and **Greatest Common Factor (GCF)**.

What is a Common Factor (CF)?

A common factor is a group of two or more whole numbers that have factors in common with one another.

Example 1: the numbers 18 and 30 have 4 common factors. Circle the common factors below.

The factors of 18 are...	The factors of 30 are...
$\begin{array}{r l} 18 & \\ \hline 1 & 18 \\ 2 & 9 \\ 3 & 6 \end{array}$ <p>(1, 2, 3, 6, 9, 18)</p>	$\begin{array}{r l} 30 & \\ \hline 1 & 30 \\ 2 & 15 \\ 3 & 10 \\ 5 & 6 \end{array}$ <p>(1, 2, 3, 5, 6, 10, 15, 30)</p>

Now, you try! Determine the common factors for 28 and 32 by drawing a Factor T or a Factor Rainbow. Then, circle the common factors.

The factors of 28 are...	The factors of 32 are...

What is the Greatest Common Factor (GCF)?

The greatest common factor (GCF) is the greatest common factor of two or more whole numbers.

For instance, in the examples above, we determined the common factors. Therefore, we should be able to determine the GCF of each pair of numbers.

What is the GCF of 18 and 30? _____

What is the GCF of 28 and 32? _____

Example 2: What is the greatest common factor for 12 and 24?

First, list the factors of 12 and 24 by drawing a Factor T or a Factor Rainbow. Circle the common factors and highlight the GCF.

The factors of 12 are...	The factors of 24 are...

Common factors: _____

Greatest common factor: _____

Show You Know!

List the common factors and find the greatest common factor for 36 and 48. Show all work in the box below.

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Common factors: _____

GCF: _____

Next, we will be using our knowledge of the greatest common factor to **reduce fractions to lowest terms!**

Reducing Fractions to Lowest Terms Common Factors and Greatest Common Factor

How do we reduce fractions to lowest terms?

Step 1: List all factors of both numbers

Step 2: Circle the GCF

Step 3: Divide the numerator and denominator by the GCF.

Example 1:

Reduce $\frac{6}{18}$ to lowest terms:

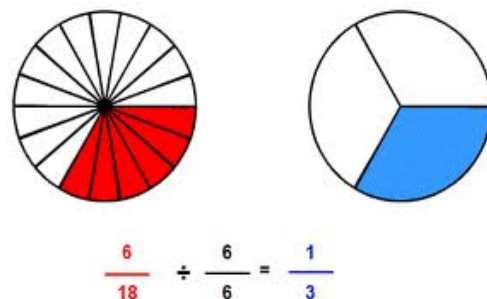
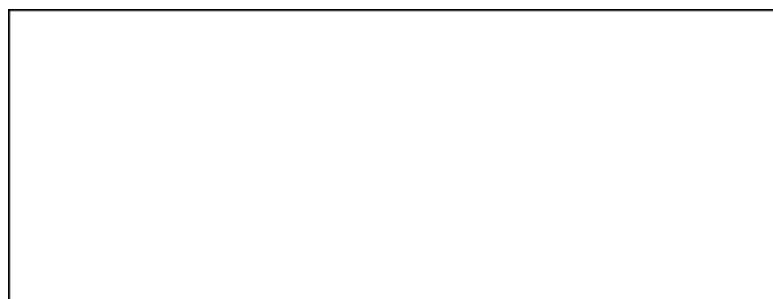
Step 1: List all factors of both numbers:

6: _____

18: _____

Step 2: Circle the GCF

Step 3: Divide the numerator and denominator by the GCF.



Example 2: Reduce $\frac{28}{36}$ to lowest terms

Reducing Fractions to Lowest Terms
Common Factors and Greatest Common Factors

Fraction	Factors Circle GCF	GCF	Reduced Fraction
$\frac{4}{6}$	4: _____ 6: _____		$\frac{4}{6} \div$ $\frac{2}{3} \div$
$\frac{10}{12}$	10: _____ 12: _____		$\frac{10}{12} \div$ $\frac{5}{6} \div$
$\frac{16}{24}$	16: _____ 24: _____		$\frac{16}{24} \div$ $\frac{2}{3} \div$
$\frac{8}{16}$	8: _____ 16: _____		$\frac{8}{16} \div$ $\frac{1}{2} \div$
$\frac{18}{20}$	18: _____ 20: _____		$\frac{18}{20} \div$ $\frac{9}{10} \div$

Fraction (Divide by GCF)	Reduced Fraction	Fraction (Divide by GCF)	Reduced Fraction
$\frac{18}{21} \div$		$\frac{8}{10} \div$	
$\frac{25}{50} \div$		$\frac{6}{15} \div$	
$\frac{6}{8} \div$		$\frac{4}{20} \div$	
$\frac{48}{60} \div$		$\frac{9}{24} \div$	
$\frac{15}{25} \div$		$\frac{2}{10} \div$	

Reminder: If you don't find the greatest common factor you will have to divide more than once.

Example: Reduce to lowest terms:

$$\frac{24}{40} \div 2 =$$

$$40 \div 2 =$$

Reduce the following fractions to lowest terms. Find the GCF first if it is helpful. Show your work.

$$1) \quad \frac{12}{15} = \underline{\hspace{2cm}}$$

$$11) \quad \frac{42}{60} = \underline{\hspace{2cm}}$$

$$2) \quad \frac{3}{30} = \underline{\hspace{2cm}}$$

$$12) \quad \frac{8}{16} = \underline{\hspace{2cm}}$$

$$3) \quad \frac{64}{80} = \underline{\hspace{2cm}}$$

$$13) \quad \frac{7}{21} = \underline{\hspace{2cm}}$$

$$4) \quad \frac{2}{4} = \underline{\hspace{2cm}}$$

$$14) \quad \frac{50}{100} = \underline{\hspace{2cm}}$$

$$5) \quad \frac{30}{100} = \underline{\hspace{2cm}}$$

$$15) \quad \frac{27}{30} = \underline{\hspace{2cm}}$$

$$6) \quad \frac{6}{24} = \underline{\hspace{2cm}}$$

$$16) \quad \frac{9}{15} = \underline{\hspace{2cm}}$$

$$7) \quad \frac{8}{32} = \underline{\hspace{2cm}}$$

$$17) \quad \frac{3}{6} = \underline{\hspace{2cm}}$$

$$8) \quad \frac{27}{90} = \underline{\hspace{2cm}}$$

$$18) \quad \frac{12}{24} = \underline{\hspace{2cm}}$$

$$9) \quad \frac{3}{6} = \underline{\hspace{2cm}}$$

$$19) \quad \frac{16}{32} = \underline{\hspace{2cm}}$$

$$10) \quad \frac{20}{100} = \underline{\hspace{2cm}}$$

$$20) \quad \frac{2}{4} = \underline{\hspace{2cm}}$$