

## GCF (5-2)

<i>greatest common factor</i>	Decode GCF
Definition a factor that two or more #'s share	Example 27 36 1 3 9 27   1 2 3 4 6 9 12 18 36

Find the GCF of 16 and 24.

the <i>old</i> way	the <i>new</i> way
<ul style="list-style-type: none"> <li>✓ 1) List all of the factors.</li> <li>✓ 2) Circle the GCF.</li> </ul> <p>16: 1 2 4 8 16 24: 1 2 3 4 6 8 12 24</p>	<ul style="list-style-type: none"> <li>✓ 1) List the prime factorization</li> <li>✓ 2) Stack 'em</li> <li>✓ 3) Circle what they have in common</li> <li>✓ 4) Multiple what they have in common (once each)</li> <li>✓ 5) Throw the rest of the numbers away</li> </ul> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>16</p> <pre>       16      / \     8   8    / \ / \   4  2 4  2  / \ / \ 2  2 2  2                     </pre> </div> <div style="text-align: center;"> <p>24</p> <pre>       24      / \     8   3    / \ / \   4  2 4  3  / \ / \ 2  2 2  3                     </pre> </div> </div> <p>16: 2 · 2 · 2 · 2 24: 2 · 2 · 2 · 3 2 · 2 · 2 = 8</p>

**Example 1:** Find the GCF of the two numbers.

I Do		You Do	
$  \begin{array}{c}  24 \\  \swarrow \downarrow \\  4 \quad 6 \\  \swarrow \downarrow \swarrow \downarrow \\  2 \quad 2 \quad 3 \quad 2  \end{array}  $	24, 84	$  \begin{array}{c}  84 \\  \swarrow \downarrow \\  2 \quad 42 \\  \swarrow \downarrow \\  2 \quad 21 \\  \swarrow \downarrow \\  3 \quad 7  \end{array}  $	$  \begin{array}{c}  21 \\  \swarrow \downarrow \\  3 \quad 7  \end{array}  $
$  \begin{array}{l}  24: 2 \cdot 2 \cdot 2 \cdot 3 \\  84: 2 \cdot 2 \cdot 3 \cdot 7 \\  2 \cdot 2 \cdot 3 = 12  \end{array}  $		$  \begin{array}{l}  21: 3 \cdot 7 \\  28: 2 \cdot 2 \cdot 7 \\  7  \end{array}  $	$  \begin{array}{c}  28 \\  \swarrow \downarrow \\  4 \quad 7 \\  \swarrow \downarrow \\  2 \quad 2  \end{array}  $

**Example 2:** Find the GCF of the three numbers.



I Do		You Do	
$  \begin{array}{c}  16 \\  \swarrow \downarrow \\  2 \quad 8 \\  \swarrow \downarrow \swarrow \downarrow \\  2 \quad 4 \quad 2 \quad 2 \\  \swarrow \downarrow \swarrow \downarrow \\  2 \quad 2 \quad 2 \quad 2  \end{array}  $	16, 40, 88	$  \begin{array}{c}  40 \\  \swarrow \downarrow \\  2 \quad 20 \\  \swarrow \downarrow \swarrow \downarrow \\  4 \quad 5 \quad 2 \quad 2  \end{array}  $	$  \begin{array}{c}  13 \\  \swarrow \downarrow \\  1 \quad 13  \end{array}  $
$  \begin{array}{l}  16: 2 \cdot 2 \cdot 2 \cdot 2 \\  40: 2 \cdot 2 \cdot 2 \cdot 5 \\  88: 2 \cdot 2 \cdot 2 \cdot 11 \\  2 \cdot 2 \cdot 2 = 8  \end{array}  $		$  \begin{array}{l}  13: 1 \cdot 13 \\  65: 5 \cdot 13 \\  117: 3 \cdot 3 \cdot 13 \\  13  \end{array}  $	$  \begin{array}{c}  117 \\  \swarrow \downarrow \\  3 \quad 39 \\  \swarrow \downarrow \swarrow \downarrow \\  3 \quad 13 \quad 3 \quad 3  \end{array}  $

$$\begin{array}{r} 27 \\ \times 2 \\ \hline 54 \end{array}$$



**Example 3:** Solve.

I Do	You Do
<p>You have 27 yellow M&amp;M's, 54 green M&amp;M's, and 63 red M&amp;M's. What is the greatest number of groups you can divide the M&amp;M's into to have the same number in each group?</p> <p>GCF</p> <p>27: <del>2</del> 3 3</p> <p>54: <del>2</del> 3 3 3</p> <p>63: <del>2</del> 3 7</p> <p>3 · 3 = 9 groups</p>	<p>There are 42 8<sup>th</sup> graders, 36 7<sup>th</sup> graders, and 24 6<sup>th</sup> graders going to activity night. If Mrs. Roggenbuck wants the same number of students from each grade on a team, how many groups can she break them into? How many from each grade will be on each team?</p> <p>24: <del>2</del> <del>2</del> 3</p> <p>36: <del>2</del> <del>2</del> 3 3</p> <p>42: <del>2</del> 3 7</p> <p>2 · 3 = 6 groups</p> <p>6<sup>th</sup>: 4 students                      7<sup>th</sup>: 6 students                      8<sup>th</sup>: 7 students</p>

