Finding Factors

**Definition:** Numbers which are multiplied together are called **factors**.

**Definition:** A **composite number** has more than two factors.

**Why is learning how to find factors important?** Being able to find the factors of a number will help us when we get to prime factorization, helps us with understanding divisibility rules, and will help us simplify fractions.

**Procedure:**
1) Make a T-Chart.
2) Put the composite number on the left side of the T-Chart.
3) Find the factors of the composite number.
4) Strike through non factors.
5) Keep going until the factors begin to repeat.

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**Example:** Find the factors of 18.

\[
\begin{array}{c|c}
18 & \\
1 \times 18 & \\
2 \times 9 & \\
3 \times 6 & \\
4 \times & \\
5 \times & \\
6 \times & \\
& 6 \text{ repeats}
\end{array}
\]

So the factors of 18 are 1, 2, 3, 6, 9, and 18.
Finding Common Factors

**Definition:** Factors that are shared by two or more numbers are called **common factors**.

**Why is learning how to find common factors important?** Being able to find common factors will help us when we need to find the Greatest Common Factor and it will help us simplify fractions.

**Procedure:**
1) Make a T-Chart.
2) Put a number on each side of the T-Chart.
3) Find the factors of each number.
4) Strike through non factors.
5) Keep going until the factors begin to repeat.
6) Circle the factors that they have in common.

**Example:** Find the common factors of 18 and 27.

<table>
<thead>
<tr>
<th>18</th>
<th>27</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 18</td>
<td>1 x 27</td>
</tr>
<tr>
<td>2 x 9</td>
<td>2 x</td>
</tr>
<tr>
<td>3 x 6</td>
<td>3 x 9</td>
</tr>
<tr>
<td>4 x</td>
<td>4 x</td>
</tr>
<tr>
<td>5 x</td>
<td>5 x</td>
</tr>
<tr>
<td>6 repeats</td>
<td></td>
</tr>
<tr>
<td>7 x</td>
<td></td>
</tr>
<tr>
<td>8 x</td>
<td></td>
</tr>
<tr>
<td>9 repeats</td>
<td></td>
</tr>
</tbody>
</table>

So the common factors of 18 and 27 are **1, 3 and 9**.
Finding the Greatest Common Factor

**Definition:** The *Greatest Common Factor* (GCF) is the largest factor that two or more numbers have in common.

**Why is it important?** The greatest common factor can be used to simplify fractions and algebraic expressions when we are working math problems. We can also use it to figure out how to make groups of different items. For example, if we know we have 18 pens and 24 pencils, we can use the greatest common factor to figure out how many bags we would need to buy in order to make equal groups of pencil and pen sets.

**Procedure:**

1) Make a T-Chart.
2) Put a number on each side of the T-Chart.
3) Find the factors of each number.
4) Strike through non factors.
5) Keep going until the factors begin to repeat. Mark where they repeat.
6) Circle the factors that they have in common.
7) Box the greatest common factor.

**Example:** Find the common factors of 18 and 24.

<table>
<thead>
<tr>
<th>18</th>
<th>24</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 18</td>
<td>1 x 24</td>
</tr>
<tr>
<td>2 x 9</td>
<td>2 x 12</td>
</tr>
<tr>
<td>3 x 6</td>
<td>3 x 8</td>
</tr>
<tr>
<td>4 x</td>
<td>4 x 6</td>
</tr>
<tr>
<td>5 x</td>
<td>5 x</td>
</tr>
<tr>
<td>6 rpts</td>
<td>6 rpts</td>
</tr>
</tbody>
</table>

So, we could make 6 equal groups of pencil and pen sets. Each group would contain 3 pens and 4 pencils.

So the common factors of 18 and 24 are 1, 2, 3, and 6.

However, the greatest common factor of 18 and 24 is **6**.