UNIT MULTIPLIER

unit multiplier - 2 units of measure equal to one in fraction form

Since 1 ft = 12 in \( \frac{1 \text{ ft}}{12 \text{ in}} \) is a unit multiplier and so is its reciprocal \( \frac{12 \text{ in}}{1 \text{ ft}} \)

1 hour = 60 min \( \frac{1 \text{ hr}}{60 \text{ min}} \) \( \frac{60 \text{ min}}{1 \text{ hr}} \) are also unit multipliers

1 Euro = $1.42 Can you name 2 unit converters?

\[ \frac{1 \text{ Euro}}{\$1.42} = \frac{\$1.42}{1 \text{ Euro}} \]

We use unit converters to convert different measurements
<table>
<thead>
<tr>
<th>Units of Length</th>
<th>Conversion</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 inches (in)</td>
<td>1 foot (ft)</td>
</tr>
<tr>
<td>3 feet</td>
<td>1 yard (yd)</td>
</tr>
<tr>
<td>1760 yards</td>
<td>1 mile (mi)</td>
</tr>
<tr>
<td>5280 feet</td>
<td>1 mile (mi)</td>
</tr>
</tbody>
</table>
Let’s start with something we know

Convert 2 feet to inches

1) I know 12 in = 1 foot so I make my 2 unit converters

\[
\begin{align*}
\frac{12 \text{ in}}{1 \text{ ft}} & \quad \frac{1 \text{ ft}}{12 \text{ in}}
\end{align*}
\]

2) put the given measure over 1

\[
\frac{2 \text{ ft}}{1}
\]

3) choose the appropriate unit converter

**NOTE** since ft is on the top I need the converter with ft on the bottom

\[
\begin{align*}
\text{given measure} \times \text{unit converter} &= \text{converted measure} \\
\frac{2 \text{ ft}}{1} \times \frac{12 \text{ in}}{1 \text{ ft}} &= \frac{24 \text{ in}}{1}
\end{align*}
\]

4) cancel measurements and make sure the proper measurement remains

\[
\frac{2 \text{ ft}}{1} \times \frac{12 \text{ in}}{1 \text{ ft}} \quad \text{remains}
\]

5) multiply the numbers

\[
\frac{2 \text{ ft}}{1} \times \frac{12 \text{ in}}{1 \text{ ft}} = \frac{24 \text{ in}}{1} = 24 \text{ in}
\]
Let's try this one
I need to convert 27 Euro's to dollars  remember 1 Euro = $1.42

1) unit converters

<table>
<thead>
<tr>
<th>1 Euro</th>
<th>$1.42</th>
</tr>
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<td>1 Euro</td>
<td>$\ 1$</td>
</tr>
</tbody>
</table>

2) put 27 Euro's over 1

\[ \frac{27 \text{ Euro's}}{1} \]

3) choose the appropriate to convertor multiply by - which do we choose and why?

\[ \frac{27 \text{ Euro's}}{1} \times \frac{$1.42}{1 \text{ Euro}} \]

4) cancel measurements and make sure $ remain since that's what answers the question

\[ \frac{27 \text{ Euro's}}{1} \times \frac{$1.42}{1 \text{ Euro}} \times 27 = 38.34 \]

$38.34