End-of-Module Assessment Task

1. Multiply or divide. Draw a model to explain your thinking.

   a. \( \frac{1}{3} \times \frac{1}{4} = \frac{1}{12} \)

   b. \( \frac{3}{4} \text{ of } \frac{1}{3} = \frac{3}{12} \)

   c. \( \frac{3}{4} \times \frac{3}{5} = \frac{9}{20} \)

   d. \( 4 \div \frac{1}{3} = 12 \)

   e. \( 5 \div \frac{1}{4} = 20 \)

   f. \( \frac{\frac{1}{4}}{5} = \frac{1}{20} \)

2. Multiply or divide using any method.

   a. \( 1.5 \times 32 = 48.0 \)

   b. \( 1.5 \times 0.32 = (1 \times 0.32) + (0.5 \times 0.32) \)

   c. \( 12 \div 0.03 = (12 \times 100) \div (0.03 \times 100) \)

   d. \( 1.2 \div 0.3 = (1.2 \times 10) \div (0.3 \times 10) \)

   e. \( 12.8 \times \frac{3}{4} = (12.8 \times \frac{3}{4}) + \left( \frac{8}{10} \times \frac{3}{4} \right) \)

   f. \( 102.4 \div 3.2 = (102.4 \times 10) \div (3.2 \times 10) \)

   \[ \begin{array}{c}
   = 924 \div 40 \\
   = 9 \frac{24}{40} \end{array} \]
3. Fill in the chart by writing an equivalent expression.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>a.</td>
<td>One-fifth the sum of one-half and one-third</td>
</tr>
<tr>
<td></td>
<td>$\frac{1}{5} \times (\frac{1}{2} + \frac{1}{3})$</td>
</tr>
<tr>
<td>b.</td>
<td>Two and one-half times the sum of nine and twelve</td>
</tr>
<tr>
<td></td>
<td>$2 \frac{1}{2} \times (9 + 12)$</td>
</tr>
<tr>
<td>c.</td>
<td>Twenty-four divided by the difference between $1 \frac{1}{2}$ and $\frac{3}{4}$</td>
</tr>
<tr>
<td></td>
<td>$24 \div (1 \frac{1}{2} - \frac{3}{4})$</td>
</tr>
</tbody>
</table>

4. A castle has to be guarded 24 hours a day. Five knights are ordered to split each day’s guard duty equally. How long will each knight spend on guard duty in one day?

   a. Record your answer in hours.

      \[
      \begin{array}{c}
      \frac{4.8}{5/24.0} \\
      \underline{-20} \\
      \underline{40} \\
      40 \quad \underline{40}
      \end{array}
      \]

      Each knight will spend 4.8 hours on guard duty in one day.

   b. Record it in hours and minutes.

      \[
      \begin{array}{c}
      \frac{4.8}{60} \text{ min} = 6 \text{ min} \\
      \frac{8}{10} \text{ of 60 min} = 48 \text{ min} \\
      4.8 \text{ hours} = 4 \text{ hours} 48 \text{ minutes}
      \end{array}
      \]

      Each knight will spend 4 hours and 48 minutes on guard duty in one day.

   c. Record your answer in minutes.

      \[
      \begin{array}{c}
      1 \text{ hour} = 60 \text{ minutes} \\
      4.8 \text{ hour} = \frac{4.8 \times 60}{2,880} \text{ hours} \\
      = 4.8 \times 1 \text{ hr} \\
      = 4.8 \times 60 \text{ min} \\
      = 288.0 \text{ min}
      \end{array}
      \]

      Each knight will spend 288 minutes on guard duty in one day.
5. On the blank, write a division expression that matches the situation.

a. \( \frac{5}{2} \)  
Mark and Jada share 5 yards of ribbon equally. How much ribbon will each get?

b. \( 5 \div \frac{1}{2} \)  
It takes half of a yard of ribbon to make a bow. How many bows can be made with 5 yards of ribbon?

c. Draw a diagram for each problem and solve.

\[
\begin{align*}
5 \div 2 &= 2\frac{1}{2} \\
\hline
\text{?} &\quad \hline \\
2 \text{ units} &= 5 \\
1 \text{ unit} &= \frac{5}{2} \\
&= \frac{5}{2} = 2\frac{1}{2}
\end{align*}
\]

\[
\begin{align*}
5 \div \frac{1}{2} &= 10 \\
\hline
\text{5} &\quad \hline \\
10 \text{ units} &= 5 \\
\frac{1}{2} \text{ of 5 units} &= \frac{1}{2} \times 5
\end{align*}
\]

d. Could either of the problems also be solved by using \( \frac{1}{2} \times 5 \)? If so, which one(s)? Explain your thinking.

\[
\begin{align*}
5 \div 2 &= 5 \times \frac{1}{2} \\
\text{Dividing by 2 is the same as taking} &\frac{1}{2} \text{ of something, which means multiplying.} \\
\frac{1}{2} \times 5 &= 5 \times \frac{1}{2}
\end{align*}
\]
6. Jackson claims that multiplication always makes a number bigger. He gave the following examples:
   - If I take 6, and I multiply it by 4, I get 24, which is bigger than 6.
   - If I take \( \frac{1}{4} \), and I multiply it by 2 (whole number), I get \( \frac{2}{4} \) or \( \frac{1}{2} \) which is bigger than \( \frac{1}{4} \).

   Jackson’s reasoning is incorrect. Give an example that proves he is wrong, and explain his mistake using pictures, words, or numbers.

\[
\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}
\]

\( \frac{1}{6} \) is smaller than \( \frac{1}{2} \) and \( \frac{1}{3} \).

7. Jill collected honey from 9 different beehives, and recorded the amount collected, in gallons, from each hive in the line plot shown:

a. She wants to write the value of each point marked on the number line above (Points A–D) in terms of the largest possible whole number of gallons, quarts, and pints. Use the line plot above to fill in the blanks with the correct conversions. (The first one is done for you.)

   A. \( \underline{0} \) gal \( 
   \underline{3} \) qt \( 
   \underline{0} \) pt

   B. \( \underline{1} \) gal \( 
   \underline{2} \) qt \( 
   \underline{0} \) pt

   C. \( \underline{2} \) gal \( 
   \underline{0} \) qt \( 
   \underline{1} \) pt

   D. \( \underline{2} \) gal \( 
   \underline{2} \) qt \( 
   \underline{1} \) pt
b. Find the total amount of honey collected from the five hives that produced the most honey.

1 unit = \(2 \frac{5}{8}\) gallons

5 units = \(5 \times 2 \frac{5}{8}\) gallons

\[= (5 \times 2) + (5 \times \frac{5}{8})\] gallons

\[= 10 + \frac{25}{8}\] gallons

\[= 10 + 3 \frac{1}{8}\] gallons

\[= 13 \frac{1}{8}\] gallons

13 \frac{1}{8} gallons or 13 gallons and 1 pint were collected from the five hives that produced the most honey.

c. Jill collected a total of 19 gallons of honey. If she distributes all of the honey equally between 9 jars, how much honey will be in each jar?

\[19 \div 9 = \frac{19}{9} = 2 \frac{1}{9}\]

There will be \(2 \frac{1}{9}\) gallons of honey in each jar.

d. Jill used \(\frac{3}{4}\) of a jar for baking. How much honey did she use baking?

\[\frac{3}{4}\] of \(2 \frac{1}{9}\) gallons

\[= \frac{3}{4} \times \frac{19}{9}\] gallons

\[= \frac{3 \times 19}{4 \times 9}\] gallons

\[= \frac{19}{12} = 1 \frac{7}{12}\] gallons

She used \(1 \frac{7}{12}\) gallons of honey for baking.
e. Jill's mom used \( \frac{1}{4} \) of a gallon of honey to bake 3 loaves of bread. If she used an equal amount of honey in each loaf, how much honey did she use for 1 loaf?

\[
\frac{1}{4} \div 3 = \frac{1}{4} \times \frac{1}{3} = \frac{1}{12}
\]

She used \( \frac{1}{12} \) of a gallon of honey for 1 loaf.

f. Jill’s mom stored some of the honey in a container that held \( \frac{3}{4} \) of a gallon. She used half of this amount to sweeten tea. How much honey, in cups, was used in the tea? Write an equation and draw a tape diagram.

\[
\frac{1}{2} \times \frac{3}{4} \text{ gallon} = \frac{3}{8} \text{ gallon}
\]

\[
\frac{3}{8} \text{ gallon} = \frac{3}{8} \times 1 \text{ gallon} = \frac{3}{8} \times 16 \text{ cups} = \frac{3 \times 16}{8} \text{ cups} = 6 \text{ cups}
\]

She used 6 cups of honey in the tea.

g. Jill uses some of her honey to make lotion. If each bottle of lotion requires \( \frac{1}{4} \) gallon, and she uses a total of 3 gallons, how many bottles of lotion does she make?

\[
3 \div \frac{1}{4} = 3 \times 4 = 12
\]

She makes 12 bottles of lotion.