#### NS4-45 Naming Fractions

The area is cut into 4 equal parts.

1 part out of 4 is shaded.

\[ \frac{1}{4} \] of the area is shaded.

**The numerator** (1) tells you one part is shaded.

**The denominator** (4) tells you how many equal parts are in a whole.

1. Write the fraction shown by the shaded part of the image.
   
   a) ![Diagram of shaded part]

   b) ![Diagram of shaded part]

   c) ![Diagram of shaded part]

   d) ![Diagram of shaded part]

   e) ![Diagram of shaded part]

   f) ![Diagram of shaded part]

2. Shade the fraction.
   
   a) \[ \frac{1}{6} \]  

   b) \[ \frac{1}{5} \]  

   c) \[ \frac{1}{9} \]  

   d) \[ \frac{1}{10} \]  

   e) \[ \frac{1}{100} \]  

   f) \[ \frac{1}{20} \]  

3. Write the words that describe each square in the figure.

   **one fourth**  
   **one fifth**  
   **one sixth**  
   **one seventh**  
   **one eighth**  
   **one ninth**

   a) ![Square diagram]

   b) ![Square diagram]

   c) ![Square diagram]
4. Write the fraction shown by the shaded part of the figure.

a) ![Fraction A]  

b) ![Fraction B]  
c) ![Fraction C]  
d) ![Fraction D]  
e) ![Fraction E]  
f) ![Fraction F]  

5. Shade the fraction.

a) \( \frac{1}{7} \)  
b) \( \frac{3}{7} \)  
c) \( \frac{6}{7} \)  
d) \( \frac{1}{8} \)  
e) \( \frac{5}{8} \)  
f) \( \frac{7}{8} \)  

6. Find a fraction in the top row that is equal to a fraction in the bottom row. Fill in the blank with the letter from the fraction in the top row.

A. ![Fraction A]  
B. ![Fraction B]  
C. ![Fraction C]  
D. ![Fraction D]  

a)  
b)  
c)  
d)  

7. Shade the fraction twice. Put a \( \checkmark \) under the figure with the larger amount of shading.

a) \( \frac{1}{10} \)  
b) \( \frac{4}{10} \)  
c) \( \frac{7}{10} \)  

\[  \] \[  \] \[  \]
NS4-47 Equivalent Fractions

1. How many times as many parts are there?
   a) has ______ times as many parts as .
   b) has ______ times as many parts as .
   c) has ______ times as many parts as .
   d) has ______ times as many parts as .

2. Fill in the blanks.
   a) A has _____ times as many parts as B.  
      A has _____ times as many shaded parts as B.

   b) A has _____ times as many parts as B.  
      A has _____ times as many shaded parts as B.

   c) A has _____ times as many parts as B.  
      A has _____ times as many shaded parts as B.

   d) A has _____ times as many parts as B.  
      A has _____ times as many shaded parts as B.
3. The picture shows two equivalent fractions. Fill in the blanks.

a) \[
\begin{array}{c}
\text{\[\frac{1}{5}\] and \[\frac{2}{10}\]}
\end{array}
\]

2 is _____ times as much as 1.
10 is _____ times as much as 5.

b) \[
\begin{array}{c}
\text{\[\frac{4}{5}\] and \[\frac{12}{15}\]}
\end{array}
\]

12 is _____ times as much as 4.
15 is _____ times as much as 5.

c) \[
\begin{array}{c}
\text{\[\frac{1}{4}\] and \[\frac{2}{8}\]}
\end{array}
\]

2 is _____ times as much as 1.
8 is _____ times as much as 4.

d) \[
\begin{array}{c}
\text{\[\frac{3}{5}\] and \[\frac{12}{20}\]}
\end{array}
\]

12 is _____ times as much as 3.
20 is _____ times as much as 5.

4. Write an equivalent fraction for the picture. Then write how many times as much the new numerator and denominator are.

a) \[
\begin{array}{c}
\text{\[\frac{3}{4}\] = \[\frac{9}{12}\]}
\end{array}
\]

_____ times as much

b) \[
\begin{array}{c}
\text{\[\frac{1}{4}\] = \[\frac{\_\_\_\_\_\_}{\_\_\_\_\_\_}\]}
\end{array}
\]

_____ times as much

c) \[
\begin{array}{c}
\text{\[\frac{3}{5}\] = \[\frac{\_\_\_\_\_\_}{\_\_\_\_\_\_}\]}
\end{array}
\]

_____ times as much

BONUS

\[
\begin{array}{c}
\text{\[\frac{7}{10}\] = \[\frac{\_\_\_\_\_\_}{\_\_\_\_\_\_}\]}
\end{array}
\]

_____ times as much
To get an equivalent fraction, multiply the numerator and denominator by the same number.

Example:

Picture A

\[
\frac{3}{4} \times 2 = \frac{6}{8}
\]

Picture B has twice as many parts as Picture A.
Picture B has twice as many shaded parts as Picture A.

5. Draw lines to cut the pies into more equal pieces. Then fill in the numerators of the equivalent fractions.

a) 4 pieces 6 pieces 8 pieces

\[
\frac{1}{2} = \frac{4}{6} = \frac{6}{8}
\]

b) 6 pieces 9 pieces 12 pieces

\[
\frac{1}{3} = \frac{6}{9} = \frac{9}{12}
\]

6. Draw lines to cut the pie into more pieces. Then fill in the missing numbers.

a) \[
\frac{2}{3} = \frac{6}{9}
\]

This number tells you how many pieces to cut each slice into.

b) \[
\frac{3}{4} = \frac{8}{10}
\]

c) \[
\frac{2}{3} = \frac{10}{15}
\]

7. Use multiplication to find the equivalent fraction.

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

b) \[
\frac{1}{2} \times 5 = \frac{5}{10}
\]

c) \[
\frac{2}{5} = \frac{10}{15}
\]

d) \[
\frac{3}{4} = \frac{8}{12}
\]

e) \[
\frac{1}{4} = \frac{12}{100}
\]

f) \[
\frac{4}{5} = \frac{15}{100}
\]

g) \[
\frac{5}{6} = \frac{12}{15}
\]

h) \[
\frac{3}{10} = \frac{9}{90}
\]

8. Write five fractions equivalent to \(\frac{2}{3}\).

\[
\frac{2}{3} = \frac{4}{6} = \frac{6}{9} = \frac{8}{12} = \frac{10}{15}
\]
NS4-48 Comparing and Ordering Fractions

1. a) Write the numerators of the shaded fractions.

\[
\begin{array}{ccc}
& \frac{4}{4} & \\
& \frac{4}{4} & \\
& \frac{4}{4} & \\
\end{array}
\]

b) Look at the pictures and fractions in part a) from left to right. Write “increases,” “decreases,” or “stays the same.”

i) Numerator _______________________.

ii) Denominator _______________________.

iii) Shaded fraction _______________________.

Comparing fractions when ...

- the numerator changes and the denominator stays the same

\[
\begin{array}{c}
\text{fewer shaded parts} \rightarrow \frac{1}{5}
\\
\text{more shaded parts} \rightarrow \frac{2}{5}
\\
\text{same number and size of parts}
\end{array}
\]

So \( \frac{2}{5} > \frac{1}{5} \) because more parts are shaded.

2. Circle the greater fraction.

a) \( \frac{2}{5} \) or \( \frac{4}{5} \)  

b) \( \frac{3}{4} \) or \( \frac{1}{4} \)  

c) \( \frac{4}{10} \) or \( \frac{9}{10} \)  

d) \( \frac{3}{3} \) or \( \frac{1}{3} \)  

3. Write any number in the blank that makes the relationship correct.

a) \( \frac{3}{7} \) > \( \frac{1}{7} \)  

b) \( \frac{14}{29} \) < \( \frac{14}{29} \)  

c) \( \frac{61}{385} \) > \( \frac{385}{385} \)  

BONUS ▶ \( \frac{2}{1000} \) < \( \frac{2}{1000} \)

4. Two fractions have the same denominator but different numerators. How can you tell which fraction is greater?
5. Use the number line to order the fractions from least to greatest. Draw an \( \times \) to mark the position of each fraction.

\[
\begin{array}{cccccccccc}
& 0 & & 1 & & 2 & & 3 & & 4 & & 5 & & 6 & & 7 & & 8 & & 9 & & 10 \\
\hline
\frac{6}{10} & < & \frac{1}{10} & < & \frac{8}{10} & < & \frac{4}{10} & < & \frac{2}{10} & < & \frac{9}{10} & < & \frac{5}{10} & < & \frac{6}{10} & < & \frac{7}{10} & < & \frac{8}{10} & < & \frac{9}{10} & < & \frac{10}{10}
\end{array}
\]

6. Order the fractions from least to greatest by considering the numerators and denominators.
   a) \[ \frac{3}{5}, \frac{0}{5}, \frac{2}{5}, \frac{5}{5}, \frac{1}{5} \]
   b) \[ \frac{6}{10}, \frac{1}{10}, \frac{4}{10}, \frac{2}{10}, \frac{9}{10} \]

7. a) What fraction of a litre is in the container?
   - 1 litre
   - 1 litre
   - 1 litre

   b) Which fraction in part a) is …
      i) the smallest? \( \square \)
      ii) the biggest? \( \square \)
      iii) in the middle? \( \square \)

c) Write “smaller” or “bigger.” As the denominator gets bigger, each part gets ______________.

Comparing fractions when ...

the numerator stays the same and the denominator changes

\[ \frac{1}{5} \]

same number of shaded parts

\( \square \square \square \) smaller parts

\( \color{gray}{\square \square} \) bigger parts

So \( \frac{1}{5} < \frac{1}{3} \) because the parts are smaller in the shape with more parts.
8. Circle the greater fraction.
   a) \( \frac{2}{5} \) or \( \frac{2}{3} \)  
   b) \( \frac{3}{4} \) or \( \frac{3}{5} \)  
   c) \( \frac{4}{5} \) or \( \frac{4}{10} \)  
   d) \( \frac{3}{4} \) or \( \frac{3}{3} \)  

9. Write any number in the blank that makes the relationship correct.
   a) \( \frac{3}{5} > \frac{8}{15} \)  
   b) \( \frac{14}{29} > \frac{15}{20} \)  
   c) \( \frac{9}{16} > \frac{9}{10} \)  
   d) \( \frac{20}{27} < \frac{20}{27} \)  

10. Two fractions have the same numerator but different denominators.  
    How can you tell which fraction is greater?

11. a) Order the fractions from least to greatest by matching each fraction to the strip it represents and then shading it.
    i) \( \frac{1}{4} \) \( \frac{1}{10} \) \( \frac{1}{2} \) \( \frac{1}{5} \) \( \frac{1}{3} \) 
    ii) \( \frac{2}{2} \) \( \frac{2}{4} \) \( \frac{2}{10} \) \( \frac{2}{3} \) \( \frac{2}{5} \)

    b) Order the fractions from least to greatest by considering the numerators and denominators.
    i) \( \frac{1}{4} \) \( \frac{1}{10} \) \( \frac{1}{2} \) \( \frac{1}{5} \) \( \frac{1}{3} \) 
    ii) \( \frac{2}{2} \) \( \frac{2}{4} \) \( \frac{2}{10} \) \( \frac{2}{3} \) \( \frac{2}{5} \)

    c) Are your answers for parts a) and b) the same? Explain.
12. Randi says that $\frac{1}{2}$ of a pie is less than $\frac{1}{10}$ of a pie. Is she correct? Explain.

______________________________________________________________________________

13. Ray, Hanna, and Lynn each brought 1 cake to school for their year-end class party. None of the cakes are the same size. The teacher cut each cake into 8 equal pieces, so everyone in the class can have a piece. Ray says, “That’s not fair at all!” and Lynn says, “That’s perfectly fair!”

a) Why does Ray think it’s unfair?

______________________________________________________________________________

b) Why does Lynn think it’s fair?

______________________________________________________________________________

14. a) Write the fractions in the correct category.

\[
\begin{array}{cccc}
\frac{3}{4} & \frac{1}{3} & \frac{2}{5} & \frac{4}{6} \\
\frac{4}{9} & \frac{3}{7} & \frac{7}{8} & \frac{6}{10} \\
\frac{5}{9} & \frac{2}{3} & \frac{1}{6} & \frac{3}{10} \\
\end{array}
\]

\[
\begin{array}{cc}
0 \text{ to } \frac{1}{2} \\
\frac{1}{2} \text{ to } 1 \\
\end{array}
\]

\[
\begin{array}{c}
\frac{3}{4} \\
\end{array}
\]

b) Use the results from part a) to write “<” or “>” in the box between the pair of fractions.

i) $\frac{6}{10}$ \[\square\] $\frac{3}{7}$  
ii) $\frac{1}{3}$ \[\square\] $\frac{3}{4}$  
iii) $\frac{4}{6}$ \[\square\] $\frac{4}{9}$  
iv) $\frac{2}{5}$ \[\square\] $\frac{5}{9}$  
v) $\frac{2}{3}$ \[\square\] $\frac{3}{10}$  
vi) $\frac{3}{7}$ \[\square\] $\frac{7}{8}$  
vii) $\frac{5}{9}$ \[\square\] $\frac{1}{6}$  
viii) $\frac{4}{9}$ \[\square\] $\frac{3}{4}$  

Number Sense 4-48
NS4-52 Decimal Tenths and Place Value

A tenth (or \(\frac{1}{10}\)) can be represented in different ways.

Mathematicians invented decimal tenths as a short form for tenths: \(\frac{1}{10} = 0.1\), \(\frac{2}{10} = 0.2\), and so on.

1. Write a fraction and a decimal for the shaded part in the boxes.
   a) \(\frac{4}{10}\) or 0.4
   b) 
   c) 

2. Write the decimal.
   a) 5 tenths = 0.5
   b) 7 tenths = 
   c) 6 tenths = 
   d) 9 tenths = 
   e) 2 tenths = 
   f) 8 tenths = 
   g) 3 tenths = 
   BONUS 0 tenths = 

3. Shade to show the decimal.
   a) 0.3
   b) 0.8
   c) 0.5
   d) 0.6

4. Show the decimal on the number line.
   a) 0.8 of the distance from 0.0 to 1.0
   b) 0.3 of the distance from 0.0 to 1.0
   c) 0.5 of the distance from 0.0 to 1.0
   d) 0.9 of the distance from 0.0 to 1.0
5. Write the place value of the underlined digit.
   a) 2.7 _______ ones _______ b) 53.9 _______ _______ c) 107.1 _______
   d) 236.4 _______ _______ e) 4501.8 _______ _______ f) 7334.5 _______
   g) 400.3 _______ _______ h) 921.2 _______ _______ i) 3677.8 _______

6. Write the place value of the digit 3 in the number.
   Hint: First underline the 3 in the number.
   a) 2361.9 _______ _______ c) 713.8 _______
   b) 405.3 _______ _______ e) 3919.1 _______ _______ f) 2854.3 _______
   d) 30.2 _______ _______ e) 3919.1 _______ _______ f) 2854.3 _______
   g) 392.7 _______ _______ h) 1636.2 _______ _______ i) 3544.5 _______

You can also write numbers using a place value chart. Example:

This is the number 7102.8 in a place value chart:

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>1</td>
<td>0</td>
<td>2</td>
<td>8</td>
</tr>
</tbody>
</table>

7. Write the number into the place value chart.

<table>
<thead>
<tr>
<th>Thousands</th>
<th>Hundreds</th>
<th>Tens</th>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>5227.6</td>
<td>5</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>8053.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>489.2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>27.8</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9104.5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8.7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>706.0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6.1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In the number 2836.5:
the digit 2 has a value of 2000—the value of the digit 2 is 2000;
the digit 8 has a value of 800—the value of the digit 8 is 800;
the digit 3 has a value of 30—the value of the digit 3 is 30;
the digit 6 has a value of 6—the value of the digit 6 is 6; and
the digit 5 has a value of $\frac{5}{10}$—the value of the digit 5 is $\frac{5}{10}$.

8. Write the value of each digit.

a) $\begin{array}{c}6 \ 5 \ 4 \ 7 \\ \frac{7}{10} \end{array}$
b) $\begin{array}{c}8 \ 2 \ 3 \ 1 \\ \frac{1}{10} \end{array}$
c) $\begin{array}{c}3 \ 2 \ 0 \ 5 \\ \end{array}$

9. What value does the digit 7 have in the number?

a) 732.6
b) 4107.9
c) 6171.2
d) 7384.5
e) 9062.7
f) 467.8
g) 1894.7
h) 2744.8
i) 7250.5
j) 6000.7
k) 3975.4
l) 743.1

10. Fill in the blank.

a) In the number 1969.5, the digit 6 stands for _____.
b) In the number 5873.2, the digit 3 stands for ______.
c) In the number 7451.3, the value of the digit 7 is ______.
d) In the number 8003.9, the value of the digit 9 is ______.
e) In the number 4855.7, the value of the digit 8 is ______.
f) In the number 9201.4, the digit _____ is in the ones place.
g) In the number 3495.6, the digit _____ is in the hundreds place.
h) In the number 6467.5, the digit _____ is in the tenths place.
1. a) Write a fraction in each blank above the number line.

b) Write a decimal in each blank below the number line.

\[ \begin{array}{ccccccccc}
\frac{0}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{10}{10} \\
0.0 & 0.1 & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & 1.0 \\
\end{array} \]

c) Which decimal is equal to the fraction?

i) \( \frac{5}{10} = \) _____

ii) \( \frac{10}{10} = \) _____

iii) \( \frac{0}{10} = \) _____

2. a) Write a decimal in each blank below the number line.

b) Cross out each incorrect fraction and write the correct fraction above it.

\[ \begin{array}{ccccccccc}
\frac{0}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & 1.0 \\
0.0 & 0.1 & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} \\
\end{array} \]

3. a) Write a fraction in each blank above the number line.

b) Cross out each incorrect decimal on the number line and write the correct decimal below it.

\[ \begin{array}{ccccccccc}
\frac{0}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & \frac{}{10} & 1.0 \\
0.0 & 0.1 & 0.2 & 0.3 & 0.4 & 0.5 & 0.6 & 0.7 & 0.8 & 0.9 \\
\end{array} \]
4. a) Fill in the missing numerators and decimals on the number lines.

\[
\begin{array}{cccc}
\frac{0}{2} & & & \frac{2}{2} \\
\hline
\hline
0.0 & & & \hline
\end{array}
\]

b) Write the decimal that the fraction is equal to.

i) \( \frac{0}{2} = 0.0 \)  
ii) \( \frac{1}{2} = \)  
iii) \( \frac{2}{2} = \)  

BONUS Write the decimals that are not equal to any fraction in part b).

\[
\begin{array}{cccc}
0.1 & & & 0.2 \\
\end{array}
\]

5. a) Fill in the missing fractions and decimals.

\[
\begin{array}{cccc}
\frac{0}{5} & & & \\
\hline
\hline
0.0 & & & \hline
\end{array}
\]

b) Write the decimal that the fraction is equal to in part b).

i) \( \frac{4}{5} = \)  
ii) \( \frac{2}{5} = \)  
iii) \( \frac{5}{5} = \)  
iv) \( \frac{1}{5} = \)  
v) \( \frac{0}{5} = \)  

BONUS Write the decimals that are not equal to any fraction in part b).

\[
\begin{array}{cccc}
0.1 & & & 0.3 \\
\end{array}
\]
NS4-54 Decimals Greater Than 1—to Tenths

1. Write a decimal in each blank below the number line.
   a) [Number Line with Decimals 1.0, 1.1, 2.0]
   b) [Number Line with Decimal 5.7]
   c) [Number Line with Decimal 63.4]

2. a) How are the scales in Question 1 different from each other?

   [Blank for Response]

   b) How are the scales in Question 1 the same as each other?

   [Blank for Response]

   You can write a decimal in words. Use “and” for the decimal point.

   Examples: 12.3 = twelve and three tenths  2.8 = two and eight tenths

3. Fill in the missing number word.
   a) 3.1 = three and _______ one ______ tenths
   b) 18.7 = eighteen and ____________ tenths
   c) 6.5 = ____________ and five tenths
   d) 20.8 = ____________ and eight tenths

4. Write the equivalent words or decimal.
   a) 7.4 = __________________________
   b) 4.9 = __________________________
   c) nineteen and one tenth = _________
   d) sixty-two and four tenths = _________
5. Count the shaded tenths. Write the amount two ways.

a) \[
\begin{array}{c}
16 \text{ tenths} = 1.6
\end{array}
\]

b) \[
\begin{array}{c}
\text{tenths} =
\end{array}
\]

c) \[
\begin{array}{c}
\text{tenths} =
\end{array}
\]

d) \[
\begin{array}{c}
\text{tenths} =
\end{array}
\]

e) \[
\begin{array}{c}
\text{tenths} =
\end{array}
\]

**BONUS**

\[
\begin{array}{c}
\text{tenths} =
\end{array}
\]
Comparing and Ordering Numbers—to Tenths

1. Write the number for each base ten model using numerals (in the box). Then circle the greater number in the pair.
   a)  
   [Base ten model image]
   3.6
   [Base ten model image]
   
   b)  
   [Base ten model image]
   
   c) Explain how you knew which number in part a) was greater.

2. Draw base ten models for the pair of numbers. Then circle the greater number.
   a) nine and seven tenths 7.9
   b) twelve and eight tenths 8.2
3. Write the value of each digit. Then complete the sentence.

a) \( \frac{7}{10} \)
\[ 8 \]
\[ 7 \]
\[ 8 \]

\[ 9 \]
\[ 7 \]

b) \[ 4 \]
\[ 3 \]
\[ 6 \]

\[ 3 \]
\[ 6 \]
\[ 4 \]

_____ is greater than _______.

_____ is greater than _______.

c) \[ 7 \]
\[ 2 \]
\[ 5 \]

\[ 7 \]
\[ 3 \]
\[ 5 \]

_____ is greater than _______.

_____ is greater than _______.

d) \[ 8 \]
\[ 7 \]
\[ 4 \]

\[ 8 \]
\[ 7 \]
\[ 5 \]

4. Circle the digits that are different in the pair of numbers. Then write the greater number in the box.

a) \[ 247.5 \]

\[ 246.5 \]

\[ 247.5 \]

b) \[ 136.0 \]

\[ 126.0 \]

\[ \text{Box for difference} \]

c) \[ 4852.5 \]

\[ 4858.5 \]

\[ \text{Box for difference} \]

d) \[ 632.5 \]

\[ 732.5 \]

\[ \text{Box for difference} \]

5. Read the numbers from left to right. Circle the first pair of digits you find that are different. Then write the greater number in the box.

a) \[ 4323.3 \]

\[ 4322.3 \]

\[ \text{Box for difference} \]

b) \[ 5090.7 \]

\[ 5900.7 \]

\[ \text{Box for difference} \]

c) \[ 756.2 \]

\[ 776.8 \]

\[ \text{Box for difference} \]

BONUS 12 146.6

\[ 12 \]
\[ 086.4 \]

\[ \text{Box for difference} \]

6. Circle the greater number.

a) \[ 8147.6 \]

\[ 9147.6 \]

b) \[ 352.1 \]

\[ 325.9 \]

c) \[ 5098.1 \]

\[ 5089.9 \]

7. Write “<” (less than) or “>” (greater than) in the box to make the statement true.

a) \[ 6726.2 \]

\[ 6726.6 \]

b) \[ 788.8 \]

\[ 788.7 \]

c) \[ 4303.2 \]

\[ 3403.9 \]
8. Write the second number below the first number with the decimal points lined up. Then circle the greater number.
   a) 1296.8 689.8  
   b) 416.2 96.2  
   c) 5137.2 5371.2  
   d) 7358.2 735.8
   \[689.8\] 

9. Circle the greatest number.
   a) 68.1 86.1 81.6  
   b) 98.3 109.3 319.4  
   c) 3670.1 3063.7 736.6  
   d) 5228.2 2558.2 852.8

10. Arrange the numbers in descending order.
   a) 549.1 5490.1 954.1  
   b) 1300.4 10002.4 989.7  
   \[1300.4\]  
   \[989.7\]  
   \[5490.1\]  
   \[549.1\]  
   \[954.1\]  
   c) 826.7 762.8 800.0  
   d) 400.1 1000.4 410.0  
   \[1000.4\]  
   \[410.0\]  
   \[400.1\]  

11. Write a number in each blank so the three numbers are arranged in ascending order.
   a) 529.9, ______, 592.2  
   b) 614.4, 641.1, ______  
   c) ______, 79.3, 790.3  
   ______, 529.9, 592.2  
   ______, 614.4, ______, 641.1  
   529.9, 592.2, ______  
   ______, 614.4, 641.1  
   79.3, ______, 790.3

12. a) Mark the numbers on the number line using an X. Then write the numbers in ascending and descending order: 519.7, 519.3, 520.0.
   \[519.0 \]  
   \[519.1 \]  
   \[519.2 \]  
   \[519.3 \]  
   \[519.4 \]  
   \[519.5 \]  
   \[519.6 \]  
   \[519.7 \]  
   \[519.8 \]  
   \[519.9 \]  
   520.0
   Ascending order: ______, ______, ______
   Descending order: ______, ______, ______
   b) Explain why it would be difficult to make a number line to mark the numbers 43.9, 9432.2, and 432.9 on.
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
   ____________________________________________
NS4-56 Adding and Subtracting Decimals—to Tenths

A base ten representation for decimal tenths:

1 one | 1 tenth |
---|---|
= | =
10 tenths

1. Regroup every 10 tenths as 1 one.

   a) Ones | Tenths |
   ---|---|
   = | =
   _____ ones + _____ tenths
   _____ ones + _____ tenths

   b) 16 tenths = _____ ones + _____ tenths
c) 23 tenths = _____ ones + _____ tenths
d) 49 tenths = _____ ones + _____ tenths
e) 52 tenths = _____ ones + _____ tenths

2. Regroup so that the tenths place value has a single digit.

   a) 3 tenths + 12 tenths = _____ one + _____ tenths
   b) 7 ones + 14 tenths = _____ ones + _____ tenths
   c) 8 tens + 6 ones + 36 tenths = _____ tens + _____ ones + _____ tenths
   d) 6 hundreds + 5 tens + 4 ones + 54 tenths = _____ hundreds + _____ tens + _____ ones + _____ tenths
   
   BONUS 9 thousands + 3 hundreds + 7 tens + 2 ones + 28 tenths = _____ thousands + _____ hundreds + _____ tens + _____ ones + _____ tenths

3. Add by adding each place value.

   a) 35.4 + 2.3
   
   | Tens | Ones | Tenths |
   ---|---|---|
   3 | 5 | 4 |
   + | 2 | 3 |
   3 | 7 | 7 |

   b) 146.1 + 22.8
   
   | Hundreds | Tens | Ones | Tenths |
   ---|---|---|---|
   + | | | |
   | | | |
4. Add by adding each place value. Then regroup.
   a) \[ 14.5 + 3.6 \]
   b) \[ 25.8 + 12.6 \]

   \[
   \begin{array}{c|c|c}
   \text{Tens} & \text{Ones} & \text{Tenths} \\
   \hline
   1 & 4 & 5 \\
   & 3 & 6 \\
   1 & 7 & 11 \\
   & 8 & 1 \\
   \end{array}
   \]

5. Add the decimals by lining up the decimal points.
   a) \[ 6.5 + 3.2 \]
   b) \[ 11.3 + 32.5 \]
   c) \[ 65.6 + 2.3 \]
   d) \[ 37.2 + 42.6 \]

   You can show regrouping on a grid. Example: \[ 4.8 + 3.5 \]
   \[
   \begin{array}{c|c|c}
   \text{Tens} & \text{Ones} & \text{Tenths} \\
   \hline
   1 & 4 & 8 \\
   3 & 5 & \\
   8 & 3 & \\
   \end{array}
   \]

   8 tenths + 5 tenths = 13 tenths were regrouped as 1 one and 3 tenths

6. Add the decimals by lining up the decimal points. You will need to regroup.
   a) \[ 6.7 + 1.8 \]
   b) \[ 24.7 + 4.3 \]
   c) \[ 57.2 + 31.9 \]
   d) \[ 63.4 + 12.6 + 1.5 \]

7. On a grid, line up the decimal points and add the numbers. You may need to regroup more than once.
   a) \[ 19.6 + 3.6 \]
   b) \[ 37.9 + 30.5 \]
   c) \[ 126.8 + 2.9 \]
   d) \[ 314.5 + 56.7 \]

8. Clara buys 3.8 kg of red apples and 2.9 kg of green apples. What is the total mass of the apples?

9. Jake weighs 45.9 kg and his dog, Spot, weighs 3.7 kg. What is their total weight in kg?
10. Subtract by crossing out ones and tenths blocks.
   a) $2.8 - 0.6 = 2.2$
   b) $3.5 - 1.4 = $
   c) $5.7 - 3.5 = $
   d) $8.9 - 4.3 = $

11. Represent some of the subtractions from Question 10 in tables by lining up the decimal points.
   a) $2.8 - 0.6 = 2.2$
   b) $5.7 - 3.5 = $
   c) $8.9 - 4.3 = $

<table>
<thead>
<tr>
<th>Ones</th>
<th>Tenths</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>8</td>
</tr>
<tr>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
</tr>
</tbody>
</table>

12. Subtract the decimals by lining up the decimal points.
   a) $10.7 - 10.3$
   b) $20.5 - 10.2$
   c) $13.4 - 2.2$
   d) $16.4 - 0.3$
   e) $52.5 - 11.5$
   f) $63.7 - 2.6$
   g) $78.8 - 7.1$
   h) $95.1 - 93.0$
   i) $4.8 - 4.4$
   j) $21.5 - 1.4$
   k) $45.5 - 12.4$
   l) $79.8 - 42.7$
When subtracting decimals, you may have to regroup.

Example:

\[
\begin{array}{c}
5.7 \\
1.8 \\
\hline
3.9
\end{array}
\quad \begin{array}{c}
4.17 \\
1.8 \\
\hline
3.9
\end{array}
\quad \begin{array}{c}
4.17 \\
1.8 \\
\hline
3.9
\end{array}
\]

Regroup 1 one as 10 tenths.

13. Exchange 1 one for 10 tenths.
   a) \(4 \text{ ones} + 0 \text{ tenths} = \underline{3} \text{ ones} + \underline{10} \text{ tenths}\)
   b) \(8 \text{ ones} + 0 \text{ tenths} = \underline{\phantom{0}} \text{ ones} + \underline{\phantom{0}} \text{ tenths}\)
   c) \(4 \text{ ones} + 3 \text{ tenths} = \underline{\phantom{0}} \text{ ones} + \underline{\phantom{0}} \text{ tenths}\)
   d) \(6 \text{ ones} + 8 \text{ tenths} = \underline{\phantom{0}} \text{ ones} + \underline{\phantom{0}} \text{ tenths}\)
   e) \(7 \text{ ones} + 4 \text{ tenths} = \underline{\phantom{0}} \text{ ones} + \underline{\phantom{0}} \text{ tenths}\)

   **BONUS** \(9823 \text{ ones} + 19 \text{ tenths} = \underline{\phantom{0}} \text{ ones} + \underline{\phantom{0}} \text{ tenths}\)

14. Subtract the decimals. Put a decimal point in your answer on the grid.
   a) \(8.1 - 5.8 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   b) \(5.7 - 3.9 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   c) \(6.1 - 4.2 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   d) \(2.4 - 0.7 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   
   e) \(4.5 - 2.6 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   f) \(31.1 - 22.2 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   g) \(57.4 - 6.6 = \underline{\phantom{0}} \underline{\phantom{0}}\)
   
   **BONUS** \(105.2 - 1.9 = \underline{\phantom{0}} \underline{\phantom{0}}\)

15. To calculate the sum, write the decimals as fractions with a common denominator.
   a) \(0.27 + 0.6 = \frac{27}{100} + \frac{6}{10} = \frac{27}{100} + \frac{60}{100} = \frac{87}{100} = \underline{\phantom{0}} \underline{\phantom{0}}\)
   b) \(0.57 + 0.76 = \frac{57}{100} + \frac{76}{100} = \frac{133}{100} = \underline{\phantom{0}} \underline{\phantom{0}}\)
   c) \(2.02 + 0.99 = \frac{202}{100} + \frac{99}{100} = \frac{201}{100} = \underline{\phantom{0}} \underline{\phantom{0}}\)
16. Subtract the decimals.
   a) $8.7 - 2.6$
   b) $29.4 - 13.1$
   c) $75.8 - 43.6$

17. Add or subtract mentally.
   a) $0.5 + 0.3 = \underline{\phantom{1.2}}$
   b) $4.9 - 2.8 = \underline{\phantom{1.2}}$
   c) $7.9 - 4.2 = \underline{\phantom{1.2}}$
   d) $2.3 + 1.2 = \underline{\phantom{1.2}}$
   e) $5.7 - 1.6 = \underline{\phantom{1.2}}$
   f) $6.7 - 2.5 = \underline{\phantom{1.2}}$
   g) $6.3 + 2.5 = \underline{\phantom{1.2}}$
   h) $4.3 - 2.1 = \underline{\phantom{1.2}}$
   i) $9.4 - 7.4 = \underline{\phantom{1.2}}$

18. What is the difference in the thickness of the coins?
   a) a quarter (1.6 mm) and a dime (1.2 mm)

19. Sara made fruit drink by mixing 1.2 L of juice with 0.9 L of ginger ale. How many litres of fruit drink did she make?

20. A large leopard, including its head, body, and tail, is 3.3 m long. Its tail is 1.4 m long. What is the length of the leopard’s head and body altogether?
The tables show how to represent money in cent notation and in dollar notation.

<table>
<thead>
<tr>
<th>Cent Notation</th>
<th>Dollar (Decimal) Notation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sixty-five cents</td>
<td>65¢</td>
</tr>
<tr>
<td>Seven cents</td>
<td>7¢</td>
</tr>
</tbody>
</table>

The dot between the 0 and the number of dimes is called a **decimal point**.

1. Write the total amount of money in cent notation and in dollar (decimal) notation.

   a) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 3 | 4 | 34¢ | $0.34 |

   b) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 0 | 5 | 5¢ | $0.05 |

   c) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 4 | 3 | 43¢ | $0.43 |

   d) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 8 | 7 | 87¢ | $0.87 |

   e) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 5 | 4 | 54¢ | $0.54 |

   f) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 0 | 9 | 9¢ | $0.09 |

   g) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 0 | 2 | 2¢ | $0.02 |

   h) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 7 | 5 | 75¢ | $0.75 |

   i) **Dimes** | **Cents** | **Cent Notation** | **Dollar (Decimal) Notation**
   
   | 0 | 1 | 1¢ | $0.01 |

2. Complete the table.

<table>
<thead>
<tr>
<th>Amount in ¢</th>
<th>Dollars</th>
<th>Dimes</th>
<th>Cents</th>
<th>Amount in $</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 143¢</td>
<td>1</td>
<td>4</td>
<td>3</td>
<td>$1.43</td>
</tr>
<tr>
<td>b) 47¢</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) 325¢</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) 3¢</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) 2816¢</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Write the amount in cent notation.
   a) $3.00 = ______
   b) $0.60 = ______
   c) $0.09 = ______
   d) $1.00 = ______
   e) $7.00 = ______
   f) $12.00 = ______
   g) $15.00 = ______
   h) $1.99 = ______
   i) $1.51 = ______
   j) $0.98 = ______
   k) $0.03 = ______
   l) $0.08 = ______

4. Write the amount in dollar notation.
   a) 254¢ = $2.54
   b) 103¢ = ______
   c) 216¢ = ______
   d) 375¢ = ______
   e) 300¢ = ______
   f) 4¢ = ______
   g) 7¢ = ______
   h) 90¢ = ______
   i) 600¢ = ______
   j) 99¢ = ______
   k) 1200¢ = ______
   l) 1604¢ = ______

5. Complete the table as shown in part a).

<table>
<thead>
<tr>
<th></th>
<th>Dollars</th>
<th>Cents</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6. Lela paid for a pencil with 3 coins. The pencil cost $0.75. Which coins did she use?

7. Ansel bought a pack of markers for $3.50. He paid for it with 5 coins. Draw the money he used.

8. Show two ways to make $5.25 with 6 coins.
PA4-13 Introduction to Algebra—Multiplication and Division

1. Draw the same number of apples in each box. Write the equation for the picture.
   a) \[ \begin{array}{c}
   \text{[Picture of apples]} \\
   + \\
   = \text{[Picture of apples]}
   \end{array} \]
   \[ \square + \square = 10 \]
   b) \[ \begin{array}{c}
   \text{[Picture of apples]} \\
   + \\
   + \\
   = \text{[Picture of apples]}
   \end{array} \]

2. Draw a picture for the equation. Use your picture to solve the equation.
   a) \[ 3 \times \begin{array}{c}
   \text{[Picture of apples]}
   \end{array} = \text{[Picture of apples]} \]
   \[ 3 \times 4 = 12 \]
   b) \[ 2 \times \begin{array}{c}
   \text{[Picture of apples]}
   \end{array} = \text{[Picture of apples]} \]
   \[ 2 \times 3 = 12 \]
   c) \[ 3 \times \begin{array}{c}
   \text{[Picture of apples]}
   \end{array} = \text{[Picture of apples]} \]
   \[ 3 \times 5 = 15 \]
   d) \[ 6 \times \begin{array}{c}
   \text{[Picture of apples]}
   \end{array} = \text{[Picture of apples]} \]
   \[ 6 \times 3 = 18 \]
   e) \[ \begin{array}{c}
   \text{[Picture of apples]} \\
   \times 2 = \text{[Picture of apples]}
   \end{array} \]
   \[ \square \times 2 = 10 \]
   f) \[ \begin{array}{c}
   \text{[Picture of apples]} \\
   \times 5 = \text{[Picture of apples]}
   \end{array} \]
   \[ \square \times 5 = 20 \]
3. How many apples should be in the box? Write the number.
   a) \(2 \times 3 = \)
   b) \(2 \times \) 
   c) \(3 \times \) 
   d) \(\) \(\times 4 = \)
   e) \(\times 3 = \)
   f) \(3 \times \) 
   g) \(\times 2 = \)
   h) \(7 \times \) 

BONUS ▶ There are 10 apples in the bag. What number goes in the box?

   \(3 \times \) 

4. Solve the equation by guessing and checking.
   a) \(5 \times \) = 30
   b) \(18 \div 2 = \)
   c) \(30 \div \) = 5
   d) \(\times 7 = 77\)
   e) \(24 \div \) = 6
   f) \(\) \(\div 5 = 10\)
   g) \(5 \times 40 = \)
   h) \(\) \(\div 4 = 7\)

5. Rewrite the multiplication as division, then solve the equation.
   a) \(\times 2 = 26\)
   b) \(96 = 3 \times \) 
   c) \(\times 4 = 80\)
   d) \(100 = \) \(\times 20\)
   e) \(\times 4 = 88\)
   f) \(150 = 50 \times \)
**PA4-14 Totals and Equations**

1. Circle the equations where the unknown is by itself.

   \[ x = 7 + 2 \quad w + 5 = 10 \quad 5 - 3 = a \quad 6 - b = 4 \quad k = 12 \div 3 \]

   There are 3 equations for a total and two parts:
   - Total = Part 1 + Part 2
   - Part 1 = Total - Part 2
   - Part 2 = Total - Part 1

2. Write three equations for the table. Circle the equation where the unknown is by itself.

   a) \[
   \begin{array}{c|c|c}
   k & 8 & 5 \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{k}{8} = \frac{8}{5} + \frac{5}{8}
   \]
   \[
   \frac{8}{5} = \frac{k}{5} - \frac{5}{5}
   \]
   \[
   \frac{5}{8} = \frac{k}{8} - \frac{8}{8}
   \]

   b) \[
   \begin{array}{c|c|c}
   24 & 21 & k \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{24}{21} = \frac{21}{k} + \frac{k}{21}
   \]
   \[
   \frac{21}{21} = \frac{21}{k} - \frac{k}{21}
   \]
   \[
   \frac{k}{21} = \frac{k}{k} - \frac{k}{21}
   \]

   c) \[
   \begin{array}{c|c|c}
   k & 17 & 3 \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{k}{17} = \frac{17}{17} + \frac{3}{17}
   \]
   \[
   \frac{17}{17} = \frac{17}{17} - \frac{3}{17}
   \]
   \[
   \frac{3}{17} = \frac{3}{17} - \frac{3}{17}
   \]

   d) \[
   \begin{array}{c|c|c}
   k & 215 & 65 \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{215}{65} = \frac{65}{k} + \frac{k}{65}
   \]
   \[
   \frac{65}{65} = \frac{65}{k} - \frac{k}{65}
   \]
   \[
   \frac{k}{65} = \frac{k}{k} - \frac{k}{65}
   \]

   e) \[
   \begin{array}{c|c|c}
   k & 97 & 18 \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{97}{18} = \frac{18}{k} + \frac{k}{18}
   \]
   \[
   \frac{18}{18} = \frac{18}{k} - \frac{k}{18}
   \]
   \[
   \frac{k}{18} = \frac{k}{k} - \frac{k}{18}
   \]

   f) \[
   \begin{array}{c|c|c}
   312 & 78 & k \\
   \hline
   \text{Total} & \text{Part 1} & \text{Part 2} \\
   \end{array}
   \]
   \[
   \frac{312}{78} = \frac{78}{k} + \frac{k}{78}
   \]
   \[
   \frac{78}{78} = \frac{78}{k} - \frac{k}{78}
   \]
   \[
   \frac{k}{78} = \frac{k}{k} - \frac{k}{78}
   \]
3. Write an equation where $m$ is by itself.

a) 
\[
\begin{array}{c|c}
17 & \quad m \\
12 & \quad 12
\end{array}
\]
\[m = 17 - 12\]

b) 
\[
\begin{array}{c|c}
8 & \quad 5 \\
\quad m & \quad \quad m
\end{array}
\]

\[m = 8 - 5\]

c) 
\[
\begin{array}{c|c|c}
m & 11 & 2
\end{array}
\]

\[m = 11 + 2\]

d) 
\[
\begin{array}{c|c|c}
9 & \quad \quad m & \quad 3
\end{array}
\]

\[m = 9 - 3\]

4. Fill in the table. Write $m$ for the number you are not given.

<table>
<thead>
<tr>
<th>Green Grapes</th>
<th>Purple Grapes</th>
<th>Total Number of Grapes</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 green grapes</td>
<td>14 grapes in total</td>
<td>14</td>
<td>$m = 14 - 6$</td>
</tr>
<tr>
<td>5 green grapes</td>
<td>3 purple grapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>11 grapes in total</td>
<td>9 green grapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 purple grapes</td>
<td>16 grapes altogether</td>
<td></td>
<td></td>
</tr>
<tr>
<td>34 purple grapes</td>
<td>21 green grapes</td>
<td></td>
<td></td>
</tr>
<tr>
<td>71 grapes altogether</td>
<td>45 purple grapes</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**BONUS**

131 purple grapes
26 green grapes

5. Circle the total in the story. Then write an equation and solve it.

a) 6 green grapes
9 grapes altogether
x purple grapes
x = 9 - 6
x = 3

b) 3 green grapes
4 purple grapes
x grapes altogether
x = 9 - 6
x = 3

c) 11 grapes altogether
7 purple grapes
x green grapes
x = 9 - 6
x = 3

d) There are 6 cats.
There are 12 dogs.
There are $x$ pets altogether.

e) There are 9 marbles.
x of them are red.
5 of them are not red.

f) Rick has 8 cousins.
x of them are boys.
3 of them are girls.
PA4-15 Differences and Equations

<table>
<thead>
<tr>
<th>Larger Part</th>
<th>Smaller Part</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

There are three equations for a difference and two parts:

- Difference = Larger Part - Smaller Part
- Larger Part = Smaller Part + Difference
- Smaller Part = Larger Part - Difference

1. Write three equations for the table. Circle the equation where the unknown is by itself.

a) 

<table>
<thead>
<tr>
<th>10</th>
<th>( b )</th>
</tr>
</thead>
</table>

\[ \text{Difference} = \text{Larger Part} - \text{Smaller Part} \]

\[ \text{Larger Part} = \text{Smaller Part} + \text{Difference} \]

\[ \text{Smaller Part} = \text{Larger Part} - \text{Difference} \]

b) 

<table>
<thead>
<tr>
<th>( b )</th>
<th>10</th>
</tr>
</thead>
</table>

\[ \text{Difference} = \text{Larger Part} - \text{Smaller Part} \]

\[ \text{Larger Part} = \text{Smaller Part} + \text{Difference} \]

\[ \text{Smaller Part} = \text{Larger Part} - \text{Difference} \]

c) 

<table>
<thead>
<tr>
<th>34</th>
<th>( b )</th>
</tr>
</thead>
</table>

\[ \text{Difference} = \text{Larger Part} - \text{Smaller Part} \]

\[ \text{Larger Part} = \text{Smaller Part} + \text{Difference} \]

\[ \text{Smaller Part} = \text{Larger Part} - \text{Difference} \]

2. Fill in the table. Write \( x \) for the number you are not given. Circle the part that is larger. Write an equation where the unknown is by itself.

<table>
<thead>
<tr>
<th>Parts</th>
<th>Cats</th>
<th>Dogs</th>
<th>Difference</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 7 cats; 12 more dogs than cats</td>
<td>7</td>
<td>( x )</td>
<td>12</td>
<td>( x = 12 + 7 )</td>
</tr>
<tr>
<td>b) 5 cats; 3 dogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) 11 more dogs than cats; 8 cats</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) 9 dogs; 3 fewer cats than dogs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) 17 dogs; 13 fewer dogs than cats</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>BONUS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100 cats; 20 fewer dogs than cats</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Circle the part that is larger. Underline the difference.

a) There are 9 hats.  
There are x scarves.  
There are 4 more hats than scarves.

b) There are x hats.  
There are 7 scarves.  
There are 5 fewer hats than scarves.

c) There are 5 hats.  
There are 6 scarves.  
There are x fewer hats than scarves.

4. Fill in the table. Write x for the number you are not given. Circle the part that is larger.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Jun has 48 American stamps in his collection. He has 12 more American stamps than Canadian stamps. How many Canadian stamps does he have?</td>
<td>American stamps</td>
<td>48</td>
<td>12</td>
<td>$x = 48 - 12$ $x = 36$</td>
</tr>
<tr>
<td>b) Lela has 12 red marbles. She has 8 green marbles. How many more red marbles than green marbles does she have?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) There are 13 dogs in a shelter. There are 7 more cats than dogs in the shelter. How many cats are there?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) A bulldog weighs 7 kg less than a boxer. The boxer weighs 35 kg. How much does the bulldog weigh?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. Write an equation where the unknown is by itself. Then solve the equation.

a) Dory hikes 8 km on Saturday. She hikes 3 km more on Sunday than on Saturday. How many kilometres did she hike on Sunday?  
b) 17 cars are parked in the school parking lot. There are 8 fewer vans than cars in the same lot. How many vans are there?  
c) A dalmatian weighs 29 kg. A dingo weighs 8 kg less. How much does the dingo weigh?  
d) Aputik biked 42 km on Saturday. On Sunday, she biked 12 km more than on Saturday. How far did she bike on Sunday?  
e) Carl counted 38 robins in his backyard on Monday and 29 robins on Tuesday. How many more robins flew through Carl's backyard on Monday?  
f) Sally counted 72 shooting stars on one night. The next night she saw 24 fewer stars than on the first night. How many shooting stars did she see on the second night?
## PA4-16 Addition and Subtraction Word Problems

1. Fill in the table. Write $x$ for the number you need to find. Cross out the information you do not use.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Parts</th>
<th>How Many?</th>
<th>Difference</th>
<th>Equation and Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Neka has 4 kg of apples and 5 kg of pears. How many kilograms of fruit does he have?</td>
<td>apples</td>
<td>4 kg</td>
<td>Difference:</td>
<td>$x = 4 + 5$ x = 9</td>
</tr>
<tr>
<td>pears</td>
<td>5 kg</td>
<td>Total:</td>
<td>x</td>
<td></td>
</tr>
<tr>
<td>b) Karen biked 47 km on Monday. She biked 54 km on Tuesday. How far did Karen bike in two days?</td>
<td>distance on Monday</td>
<td>Difference:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Alice raised $32 for charity. Ben raised $9 less than Alice. How much money did Ben raise?</td>
<td>Difference:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Alexa bought 3000 millilitres of apple juice. She bought 2000 more millilitres of apple juice than plum juice. How much plum juice did she buy?</td>
<td>Difference:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) The cafeteria sold 350 cartons of milk. 198 of them were cartons of white milk. The rest were chocolate milk. How many cartons of chocolate milk did the cafeteria sell?</td>
<td>Difference:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>f) The height of Mount Kilimanjaro is 5895 m. That is 2953 m less than the height of Mount Everest. How tall is Mount Everest?</td>
<td>Difference:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
2. The world's tallest tree is about 116 m tall. The Horseshoe Falls at Niagara Falls is about 51 m tall. How much taller is the tallest tree than the Horseshoe Falls?

3. Solve the problem. Use your answer from part i) as data for part ii).
   a) i) Tom bought 9 hockey cards and 6 baseball cards. How many cards did he buy altogether?
      ii) Tom gave away 5 cards. How many does he have left?
   b) There are 24 players on a hockey team, and 15 of them are new to the team.
      i) How many players are not new to the team?
      ii) How many more new players than not new players are on the team?

4. Solve the two-step problem.
   a) Sara bought 8 red jelly beans and 5 white jelly beans. She ate 4 of them. How many jelly beans does she have left?
   b) Marko downloaded 7 songs. He downloaded 3 more songs than movies. How many songs and movies did he download altogether?
   c) Ray had $32. He bought the book, magazine, and scissors below. How much money does he have left?

5. Ivan invited 10 friends from school and 8 friends from camp to his birthday party.
   a) How many more friends from school than friends from camp were supposed to be at the party?
   b) Two friends from school and three friends from camp could not come to the party. How many friends were at the party?
   c) Were there more friends from school or more friends from camp at the party? How many more?

6. The table shows the number of cars arriving at the train station parking lot. No cars leave the lot in the morning.
   a) How many cars are parked in the lot at 7:00 a.m.?
   b) How many cars are parked in the lot at 8:00 a.m.?
   c) There are 1008 spaces in total in the lot. How many are still available at 8:00 a.m.?

<table>
<thead>
<tr>
<th>Time</th>
<th>Number of Cars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before 6:00 a.m.</td>
<td>378</td>
</tr>
<tr>
<td>From 6:00 a.m. to 7:00 a.m.</td>
<td>459</td>
</tr>
<tr>
<td>From 7:00 a.m. to 8:00 a.m.</td>
<td>125</td>
</tr>
</tbody>
</table>
PA4-17 Models and Times as Many

1. Draw a model for the story.
   a) Don has 5 stamps. Jasmin has 3 times as many as Don does.
      __________
      Don’s stamps:        5
      __________
      Jasmin’s stamps:    5 5 5
   b) There are 3 red grapes. There are 5 times as many green grapes as red grapes.
      __________
      __________
   c) There are 16 green pears. There are 4 times as many red pears as green pears.
      __________
      __________
   d) Anne has 4 markers. Fred has 5 times as many markers as Anne.
      __________
      __________

2. Solve the problem by drawing a model.
   a) Ansel has 6 stamps. Jen has 3 times as many stamps as Ansel. How many stamps do they have altogether?
      __________
      Ansel’s stamps:        6 6 stamps
      __________
      Jen’s stamps:    6 6 6 18 stamps
      6 + 18 = 24, so Jen and Ansel have 24 stamps altogether.
   b) Lewis studies spiders and scorpions. He has 6 spiders and twice as many scorpions. How many spiders and scorpions does he have altogether?
      __________
      __________

(c) There are 4 hamsters in a store. There are six times as many mice in the store. How many mice and hamsters are there altogether?
3. Draw a model for the story.
   a) Mandy has four times as many stickers as Ethan.

   **Mandy’s stickers:**
   [Diagram of 4 stickers]
   **Ethan’s stickers:**
   [Diagram of 1 sticker]

   b) Mary is three times as old as Armand.
   [Diagram of 3 bars]
   [Diagram of 1 bar]

   c) There are five times as many green grapes as red grapes.
   [Diagram of 5 green grapes]
   [Diagram of 1 red grape]

   d) A book is two times thicker than a notebook.
   [Diagram of 2 bars]
   [Diagram of 1 bar]

   e) There are three times as many lizards as snakes in the zoo.
   [Diagram of 3 lizards]
   [Diagram of 1 snake]

4. Draw a model for the story. Then write the given number beside the correct bar.
   a) There are 20 carrots. There are 4 times as many carrots as potatoes.

   **carrots:** 20
   [Diagram of 4 carrots]
   **potatoes:**
   [Diagram of 1 potato]

   b) There are 30 cars in a parking lot. There are 6 times as many cars as vans in the lot.
   [Diagram of 6 bars]
   [Diagram of 1 bar]

   c) Nora chopped up 70 carrots and twice as many little tomatoes for a salad.
   [Diagram of 140 carrots]
   [Diagram of 2 tomatoes]
5. Draw the model.

a) Jayden needs three times as many blueberries as raspberries to make jam. He needs 6 cups more blueberries than raspberries. He needs 12 cups of berries altogether.

\[
\begin{align*}
\text{blueberries:} & \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quad \quarter
7. Draw the model. Find the size of one block in the model. Then solve the problem.

   a) Zack has four times as many stickers as Alex. Zack has 15 more stickers than Alex. How many stickers does each person have?

   **Zack’s stickers:** 5 5 5 5

   **Alex’s stickers:** 5 15

   Zack has __20__ stickers and Alex has __5__ stickers.

   b) Hanna is three times as old as Marcel. Hanna is 8 years older than Marcel. How old are Hanna and Marcel?

   __________

   __________

   Hanna is _______ years old and Marcel is _______ years old.

   c) There are five times as many green apples as red apples. There are 24 apples altogether. How many apples of each colour are there?

   __________

   __________

   There are _______ green apples and _______ red apples.

   d) A granola recipe calls for seven times as much oatmeal as nuts. Avril wants to make 400 grams of granola. How many grams of nuts and oatmeal does she need?

   __________

   __________

   Avril needs _______ grams of oatmeal and _______ grams of nuts.

   e) A rottweiler weighs five times as much as a Scottish terrier. The Scottish terrier weighs 36 kg less than the rottweiler. How much does each dog weigh?

   __________

   __________

   The Scottish terrier weighs _______ kg and the rottweiler weighs _______ kg.

   f) A pair of pants costs twice as much as a shirt. Fred paid $42 for a pair of pants and a shirt. How much did each item cost?

   **BONUS** ▶ How much would Fred pay for two pairs of pants and three shirts?
When the larger part is 3 times the size of the smaller part, we say the **scale factor** is 3.

You can find one part from another part using the scale factor.

Smaller Part = Larger Part \times \text{Scale Factor}

Larger Part = Smaller Part \div \text{Scale Factor}

---

1. Circle the larger part and underline the smaller part in the problem. Then fill in the blanks for the equation where the unknown is by itself and cross out the other equation.

   a) There are 21 cats and \( w \) dogs. There are three times as many dogs as cats.

   \[
   \frac{w}{\text{Larger Part}} = \frac{21}{\text{Smaller Part}} \times \frac{3}{\text{Scale Factor}}
   \]

   b) There are 6 plums and \( w \) pears. There are 2 times as many plums as pears.

   \[
   \frac{\text{Larger Part}}{\text{Smaller Part}} = \frac{6}{\text{Smaller Part}} \times \frac{2}{\text{Scale Factor}}
   \]

   c) There are 8 cats and \( w \) dogs. There are 4 times as many dogs as cats.

   \[
   \frac{\text{Larger Part}}{\text{Smaller Part}} = \frac{8}{\text{Smaller Part}} \times \frac{4}{\text{Scale Factor}}
   \]

   d) There are 12 adults in a chess club. There are twice as many teenagers as adults in the chess club.

   \[
   \frac{\text{Larger Part}}{\text{Smaller Part}} = \frac{12}{\text{Smaller Part}} \times \frac{2}{\text{Scale Factor}}
   \]

2. Fill in the table. Write \( w \) for the number you are not given. Hint: Circle the larger part and underline the smaller part.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Part</th>
<th>How Many?</th>
<th>Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) There are 20 green apples in a box. There are 4 times as many green apples as red apples.</td>
<td>green apples</td>
<td>20</td>
<td>( 20 \div 4 = w )</td>
</tr>
<tr>
<td>b) There are 16 pears. There are twice as many pears as bananas.</td>
<td>red apples</td>
<td>( w )</td>
<td></td>
</tr>
<tr>
<td>c) There are 6 cats in a shelter. There are three times as many dogs as cats in the shelter.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) Sun planted 40 bean seeds. That is 5 times as many as the corn seeds she planted. How many corn seeds did she plant?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Complete the table.

<table>
<thead>
<tr>
<th>Total Number of Things</th>
<th>Number of Sets</th>
<th>Number in Each Set</th>
<th>Multiplication or Division Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) w</td>
<td>6</td>
<td>3</td>
<td>(6 \times 3 = w)</td>
</tr>
<tr>
<td>b) 20</td>
<td>4</td>
<td>w</td>
<td>(20 \div 4 = w)</td>
</tr>
<tr>
<td>c) 18</td>
<td>w</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>d) 24</td>
<td>2</td>
<td>w</td>
<td></td>
</tr>
<tr>
<td>e) w</td>
<td>4</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>f) 35</td>
<td>w</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

4. Fill in the table. Write \(w\) to show what you don’t know. Then write a multiplication or division equation in the last column and solve the problem.

<table>
<thead>
<tr>
<th>Total Number of Things</th>
<th>Number of Sets</th>
<th>Number in Each Set</th>
<th>Multiplication or Division Equation</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) 36 people</td>
<td>36</td>
<td>3</td>
<td>(36 \div 3 = w)</td>
</tr>
<tr>
<td>3 vans</td>
<td></td>
<td></td>
<td><strong>12</strong> people in each van</td>
</tr>
<tr>
<td>b) 10 marbles in each</td>
<td>6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>jar</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) 35 flowers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 pots</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) 6 chairs at each</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>table</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7 tables</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

5. a) A soccer league has 8 teams with 11 players each. How many players are in the league?

b) A birch tree is 15 m tall. A maple tree is twice as tall the birch. How tall is the maple tree?

c) Zara is 35 years old. Zara is 5 times as old as Ken. How old is Ken?

d) A box of pencils costs $2. How much do 25 boxes of pencils cost?

e) Ella paid $15 for three scarves. If all the scarves cost the same amount, how much did each one cost?

BONUS ➤ A male mountain gorilla weighs 200 kg, four times as much as a male chimpanzee. How much does the chimpanzee weigh?
ME4-9 Perimeter

The distance around the outside of a shape is the perimeter of the shape.

The edges of the squares in this figure measure 1 cm.
The perimeter of the figure is 6 cm.

1. Each edge is 1 cm long. Trace the perimeter of the figure. Find the perimeter in centimetres.
   a) ______ cm  
   b) ______ cm  
   c) ______ cm

2. Each edge is 5 mm long. Count by 5s to find the perimeter in millimetres.
   a) ______ mm  
   b) ______ mm  
   c) ______ mm  
   d) ______ mm

3. Draw your own figure on the centimetre grid and find its perimeter. (Do not use diagonal lines.)

4. What unit would you use to measure the perimeter: cm, m, or km?
   a) a book: ______   
   b) a forest: ______   
   c) a basketball court: ______
   d) a classroom: ______   
   e) a province: ______   
   f) a basketball hoop: ______
5. Why might you want to use millimetres to measure a perimeter?

6. Add to find the perimeter of the figure.
   a) \[
   \begin{array}{c}
   5 \text{ m} \\
   7 \text{ m} \\
   5 \text{ m}
   \end{array}
   \]
   Perimeter = ______
   b) \[
   \begin{array}{c}
   3 \text{ cm} \\
   6 \text{ cm} \\
   5 \text{ cm} \\
   4 \text{ cm}
   \end{array}
   \]
   Perimeter = ______
   c) \[
   \begin{array}{c}
   2 \text{ km} \\
   2 \text{ km} \\
   2 \text{ km}
   \end{array}
   \]
   Perimeter = ______
   d) \[
   \begin{array}{c}
   1 \text{ dm} \\
   2 \text{ dm} \\
   2 \text{ dm} \\
   3 \text{ dm}
   \end{array}
   \]
   Perimeter = ______

7. Measure the perimeter of the figure in millimetres. Use a ruler.
   a) \[
   \begin{array}{c}
   \end{array}
   \]
   b) \[
   \begin{array}{c}
   \end{array}
   \]
   c) \[
   \begin{array}{c}
   \end{array}
   \]

8. Estimate the perimeter of the figure in centimetres. Then measure the actual perimeter with a ruler.
   a) \[
   \begin{array}{c}
   \end{array}
   \]
   Estimated perimeter = ______
   Actual perimeter = ______
   b) \[
   \begin{array}{c}
   \end{array}
   \]
   Estimated perimeter = ______
   Actual perimeter = ______
**ME4-10 Calculating Perimeter**

1. The pictures show the designs for two gardens. Find the perimeter of each garden by writing an addition equation.

![Garden Designs](image)

2. Write the number of boxes along the width and the length of the rectangle. Then write an addition equation and find the perimeter (in centimetres).

   a) Length
      
      Width = ______ cm
      
      Perimeter = ________________
   
   b) Length
      
      Width = ______ cm
      
      Perimeter = ________________
   
   c) Length
      
      Width = ______ cm
      
      Perimeter = ________________
   
   d) Length
      
      Width = ______ cm
      
      Perimeter = ________________

3. Write a rule for finding the perimeter of a rectangle from its length \((l)\) and width \((w)\).
A rectangle has perimeter 12 m. Each side is an exact number of metres long. What are the dimensions of the rectangle? Let’s try different widths. Try 1 m first.

The widths add to 2 m.
The missing lengths are $12 \text{ m} - 2 \text{ m} = 10 \text{ m}$ altogether.
Each length is $10 \text{ m} \div 2 = 5 \text{ m}$.

4. a) The widths add to ____ m.
   b) The missing lengths are $12 \text{ m} - ____ \text{ m} = ____ \text{ m}$ altogether.
   c) Each length is ____ m $\div 2 = ____ \text{ m}$.

5. a) The widths add to ____ m.
   b) The missing lengths are _______________ altogether.
   c) Each length is _______________ m.

6. Find the missing sides. (The pictures are not drawn to scale.)
   a) Perimeter = 14 m
   b) Perimeter = 14 cm
   c) Perimeter = 10 m
   d) Perimeter = 14 cm

7. Find all rectangles with the given perimeter (with lengths and widths that are exact numbers of units).

8. Write a rule for finding the perimeter of a square from its side length.
The **area** of a flat shape is the amount of space it takes up. A **square centimetre** (cm\(^2\)) is a unit for measuring area. A square with sides 1 cm has an area of 1 cm\(^2\).

1. Find the area of the figure in square centimetres.
   - a) 
     ![Figure a)
   - Area = ______ cm\(^2\)
   - b) 
     ![Figure b)
   - Area = ______ cm\(^2\)
   - c) 
     ![Figure c)
   - Area = ______ cm\(^2\)

2. Using a ruler, draw lines to join the marks and divide the rectangle into square centimetres.
   - a) 
     ![Figure a)
   - Area = ______ cm\(^2\)
   - b) 
     ![Figure b)
   - Area = ______ cm\(^2\)
   - c) 
     ![Figure c)
   - Area = ______ cm\(^2\)

3. Find the area of the rectangles in square centimetres.
   - ![Rectangle A]
   - Area of A = ______ cm\(^2\)
   - ![Rectangle B]
   - Area of B = ______ cm\(^2\)
   - ![Rectangle C]
   - Area of C = ______ cm\(^2\)

4. Use 1 cm grid paper.
   - a) Draw two different rectangles with an area of 8 cm\(^2\).
   - b) Draw two figures that are not rectangles with an area of 8 cm\(^2\).
   - c) Draw several shapes and find their area.
   - d) Draw three different rectangles with an area of 12 cm\(^2\).
**ME4-14 Area in Square Metres**

A **square metre** (m²) is a unit for measuring area. A square with sides 1 m has an area of 1 m².

Four unfolded pages from a newspaper are about 1 m².

1. Shelly measured the areas of objects at school, but she forgot to write down the units. Fill in the blank with “m²” or “cm².”
   a) The wall measures 8 _____.
   b) The book cover measures 375 _____.
   c) The sticky note measures 15 _____.
   d) The parking lot measures 475 _____.

2. Choose a unit of measure for the area. Estimate and then measure the area of the object.

<table>
<thead>
<tr>
<th>Object</th>
<th>Unit</th>
<th>Estimate</th>
<th>Actual Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) blackboard</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) JUMP Math AP Book</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) hallway</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>d) desk</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>e) light switch</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

3. Ethan says that since there are 100 cm in 1 m, there must be 100 cm² in 1 m². Is he correct? Explain.

**BONUS** Why might someone measure a large area in cm²?
ME4-15 Area of Rectangles

1. Write a multiplication statement for the array.
   a) b) c) d)

2. Draw a dot in each box. Then write a multiplication statement that tells you the number of boxes in the rectangle.
   a) b) c) d)

3. Write the number of boxes along the length and the width of the rectangle. Then write a multiplication equation for the area of the rectangle (in square units).
   a) b) c) Width Width Width
   Length = ___ Length = ___ Length = ___

4. Using a ruler, draw lines to join the marks and divide the rectangle into square centimetres. Write a multiplication equation for the area of the rectangle in square centimetres.
   a) b) c)

   Area = ____________ Area = ____________ Area = ____________

5. How can you find the area of a rectangle from its length and width?

   ____________________________
6. Measure the length and width of the rectangle. Find the area. Include the units!
   a) 
   b) 
   c) 

7. Area is also measured in other square units. Predict the name of the unit.
   a) 
   b) 
   c) 

8. a) Calculate the area of each rectangle (include the units).
   
   Area = 
   Area = 
   Area = 
   Area = 

   b) List the rectangles from least area to greatest area: _____, _____, _____, _____

   What does it spell? ________________

9. Find the area of the rectangle using the length and the width. Include the units!
   a) Length = 7 m   Width = 5 m   b) Length = 9 m   Width = 2 m   c) Length = 8 cm   Width = 6 cm
   Area = _____ 
   Area = _____ 
   Area = _____ 

   d) Length = 7 cm   e) Length = 9 m   f) Length = 12 cm
   Width = 11 cm   Width = 12 m   Width = 3 cm
   Area = _____ 
   Area = _____ 
   Area = _____ 

Measurement 4-15
95
ME4-23 O’Clock, Half, and Quarter Hours

It is 8 o’clock.
The hour hand is on the 8.
The minute hand is on the 12.
The time is 8:00.

1. Write the time two ways.
   a)
   b)
   c)
   d)

   6 o’clock
   _____ : _____

2. Write the time in numbers.
   a) 7 o’clock
   b) 5 o’clock
   c) 11 o’clock
   d) 3 o’clock

3. Draw hands on the clock to show the time.
   a) 7:00
   b) 2 o’clock
   c) 3 o’clock
   d) 4:00

BONUS
   e) midnight
   f) 13:00
   g) 16:00
   h) noon
It is half an hour after 8:00. The hour hand is between 8 and 9. The time is **half past 8**. 

\[ 60 \div 2 = 30 \], so the time is 8:30.

4. Write the time two ways.
   a) ![Clock](image1)
   b) ![Clock](image2)
   c) ![Clock](image3)
   d) ![Clock](image4)

   **half past 6**  
   **half past 6**

5. Write the time in numbers.
   a) half past 7  
   b) half past 5  
   c) half past 11  
   d) half past 3

6. Draw hands on the clock to show the time.
   a) ![Clock](image5)
   b) ![Clock](image6)
   c) ![Clock](image7)
   d) ![Clock](image8)

   **7:30**  
   **half past 2**  
   **30 minutes after 3**  
   **4:30**

**BONUS**
   e) ![Clock](image9)
   f) ![Clock](image10)
   g) ![Clock](image11)
   h) ![Clock](image12)

   **17:30**  
   **half past noon**  
   **20:30**  
   **half hour to midnight**
It is a quarter of an hour after 7:00 or **quarter past** 7.

\[ 60 \div 4 = 15, \text{ so the time is } 7:15. \]

7. Write the time in words and numbers. Use “quarter” in your answer.

\[ \begin{align*}
\text{a)} & \quad 7 \text{ o'clock quarter past } 7 \\
\text{b)} & \quad 7 \text{ o'clock quarter past } 7 \\
\text{c)} & \quad 7 \text{ o'clock quarter past } 7
\end{align*} \]

8. Write the time in words and numbers. Use “quarter” in your answer.

\[ \begin{align*}
\text{a)} & \quad 7 \text{ o'clock quarter to } 7 \\
\text{b)} & \quad 7 \text{ o'clock quarter to } 7 \\
\text{c)} & \quad 7 \text{ o'clock quarter to } 7
\end{align*} \]
9. Write the time in numbers.
   a) quarter past 7  b) quarter to 7  c) quarter past 11  d) quarter to 11
   e) quarter past 1  f) quarter to 4  g) quarter to 9  h) quarter past 5
   i) half past 9  j) quarter to 12  k) half past 2  l) quarter past 3

10. Draw hands on the clock to show the time.
   a)  b)  c)  d)  

   ![Clock](7:15)  ![Clock](9:15)  ![Clock](quarter past 4)  ![Clock](quarter past 6)
   e)  f)  g)  h)  

   ![Clock](10:45)  ![Clock](8:45)  ![Clock](quarter to 4)  ![Clock](quarter to 6)
   i)  j)  k)  l)  

   ![Clock](12:15)  ![Clock](22:45)  ![Clock](half past 4)  ![Clock](6 o'clock)

11. Is the hour hand closer to 4 or to 5 ...
   a) at 4:15?  b) at 4:45?  BONUS at 4:30?
ME4-25 Telling Time to the Minute

Each division on the clock stands for 1 minute.

The minute hand is pointing between the 4 and the 5. Count by 5s until you reach the 4: twenty minutes have passed. Then count on by ones: two minutes have passed.

\[ 20 + 2 = 22 \text{ minutes have passed} \]

It is \textbf{7:22} or \textbf{22 minutes after 7}.

1. How many minutes past the hour is it?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>b)</td>
<td>c)</td>
</tr>
<tr>
<td>[Clock showing 7:24]</td>
<td>[Clock showing 7:10]</td>
<td>[Clock showing 7:20]</td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

2. What time is it?

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>b)</td>
<td>c)</td>
</tr>
<tr>
<td>[Clock showing 10:00]</td>
<td>[Clock showing 9:15]</td>
<td>[Clock showing 9:30]</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. Write the exact time.

a) ![Clock](image1)

6 : 24

d) ![Clock](image2)

__ : __

g) ![Clock](image3)

__ : __

BONUS

h) ![Clock](image4)

__ : __

j) ![Clock](image5)

__ : __

i) ![Clock](image6)

__ : __

k) ![Clock](image7)

__ : __

l) ![Clock](image8)

__ : __
The minute hand is pointing between the 8 and the 9.
To say how many minutes to the hour:
Count by 5s until you reach the 9. Then count on by ones.
$15 + 2 = 17$ minutes are left before the next hour.
It is **17 minutes to 7**.

4. How many minutes to the hour is it?

   a) ![Clock](image)
   _24_ minutes to 7

   b) ![Clock](image)
   ______ _minutes to 9

   c) ![Clock](image)
   ______ _minutes to 1

5. What time is it?

   a) ![Clock](image)
   ______ _minutes to _____

   b) ![Clock](image)
   ______ _minutes to _____

   c) ![Clock](image)
   ______ _minutes to _____

   d) ![Clock](image)
   ______ _minutes past _____

   e) ![Clock](image)
   ______ _minutes to _____

   f) ![Clock](image)
   ______ _minutes past _____
6. Tell the time two ways.

a) minutes past _____  b) minutes past _____  c) minutes past _____
   minutes to _____  minutes to _____  minutes to _____

REMINDER  1 hour = 60 minutes.

It is 4:35. This is 35 minutes past 4.

How much time is left till 5 o’clock?

60 − 35 = 25, so it is 25 minutes to 5.

7. Tell the time two ways.

a)  b)  c)

8. Write the time in numbers.

a) twenty minutes after five 5:20  b) quarter past eleven ______:_____
   c) three fifty-six ______:_____
   d) eight thirty ______:_____
   e) forty-one minutes after seven ______:_____
   f) quarter to nine ______:_____

BONUS  

g) twenty-three minutes to four ______:_____
   h) nineteen minutes to twelve ______:_____

BONUS  Write the time shown on the clock three different ways.

_______

_______

_______
ME4-26 Time Intervals

1. Count by 5s to find the time interval.
   a) 8:10 to 8:25  
   
   ![Clock diagram for a) 8:10 to 8:25]
   
   15 minutes

   b) 3:15 to 3:40  
   
   ![Clock diagram for b) 3:15 to 3:40]
   
   
   c) 10:25 to 11:00  
   
   ![Clock diagram for c) 10:25 to 11:00]
   
   
   d) 7:35 to 8:00  
   
   ![Clock diagram for d) 7:35 to 8:00]
   
   
   e) 3:40 to 4:05  
   
   ![Clock diagram for e) 3:40 to 4:05]
   
   
   f) 9:25 to 10:20  
   
   ![Clock diagram for f) 9:25 to 10:20]
   
   

2. Count by 5s and then by 1s to find how much time has elapsed.
   a) 8:35 to 8:57  
   
   ![Clock diagram for a) 8:35 to 8:57]
   
   
   b) 4:30 to 5:04  
   
   ![Clock diagram for b) 4:30 to 5:04]
   
   
   c) 6:20 to 7:17  
   
   ![Clock diagram for c) 6:20 to 7:17]
   
   
   d) 4:20 to 4:57  
   
   ![Clock diagram for d) 4:20 to 4:57]
   
   
   e) 1:15 to 1:31  
   
   ![Clock diagram for e) 1:15 to 1:31]
   
   
   f) 5:40 to 6:19  
   
   ![Clock diagram for f) 5:40 to 6:19]
3. Count by 5s to find the time interval.
   a) 1:12 to 1:52
   b) 6:18 to 6:43
   c) 7:49 to 8:09

4. Count by 5s and then by 1s to find the time interval.
   a) 3:14 to 3:47
   b) 11:36 to 11:54
   c) 4:48 to 5:12

5. Count by 5s to estimate the time interval. Then find the actual time interval.
   a) 2:47 to 3:15
   b) 4:33 to 4:59
   c) 9:21 to 9:38

6. It is now 5:13. Matt started playing at 4:21. How long has he been playing?
7. The clock shows the time Kate started reading. At what time did she finish reading? Draw an arrow on the clock to show the time she finished.

a) Kate read for 20 minutes.  
b) Kate read for 15 minutes.  
c) Kate read for 23 minutes.

Kate finished at ________.  Kate finished at ________.  Kate finished at ________.

Jake started reading at 1:21. He read for 36 minutes. When did he finish reading?

1:21 ← start time  
+ 0:36 ← elapsed time = 36 minutes = 0 hours 36 minutes = 0:36  
1:57

Jake finished reading at 1:57.

8. Add to find the end time.

a) 3:23  
+ 0:20  
3:43 

b) 8:22  
+ 0:11  
8:33 

c) 1:48  
+ 5:00  
6:48 

d) 6:37  
+ 2:15  
8:52 

e) 3:42  
+ 8:09  
11:51

9. Regroup 60 minutes as 1 hour.

a) 2:65  
3:05 

b) 7:71  
8:11 

c) 8:80  
9:20 

d) 2:92  
3:32 

e) 1:105

10. Add and regroup to find the end time.

a) 3:23  
+ 1:40  
4:63 

b) 8:22  
+ 0:51  
8:73 

c) 9:48  
+ 1:30  
11:18 

d) 6:43  
+ 2:25  
9:08 

e) 3:42  
+ 1:50  
5:32

11. a) Nina goes to bed at 7:45 p.m. Evan's bedtime is 30 minutes later. 
What time does Evan go to bed?

b) Tess put chicken in the oven at 4:52 p.m. It should bake for 1 hour and 40 minutes. 
At what time should she take it out?

12. Cody started reading at 3:33. He finished at 4:27. How long was he reading?

BONUS Muffins need to bake for 22 minutes. You want them to be ready at 6:00 p.m. 
When should you put the muffins into the oven?
1. Find how much time has passed between the times in bold (intervals are not shown to scale).
   a) \[\begin{array}{c}
   5:45 \quad 5:50 \quad 5:55 \quad 6:00 \quad 7:00 \quad 8:00 \quad 8:05 \quad 8:10 \\
   \hline
   15 \text{ minutes} \quad 2 \text{ hours} \quad 10 \text{ minutes}
   \end{array}\]
   Elapsed time: 2 hours 25 minutes

   b) \[\begin{array}{c}
   11:50 \quad 11:55 \quad 12:00 \quad 1:00 \quad 2:00 \quad 3:00 \quad 3:05
   \end{array}\]
   Elapsed time:

   c) \[\begin{array}{c}
   7:45 \quad 7:50 \quad 7:55 \quad 8:00 \quad 9:00 \quad 10:00 \quad 10:05 \quad 10:10 \quad 10:15
   \end{array}\]
   Elapsed time:

2. Find how much time has passed between the times in bold. Regroup 60 minutes as 1 hour.
   a) \[\begin{array}{c}
   5:25 \quad 6:00 \quad 7:00 \quad 8:00 \quad 8:30
   \end{array}\]
   Elapsed time: 2 hours 65 minutes = 3 hours 5 minutes

   b) \[\begin{array}{c}
   1:10 \quad 2:00 \quad 3:00 \quad 4:00 \quad 5:00 \quad 5:25
   \end{array}\]
   Elapsed time:

   c) \[\begin{array}{c}
   9:15 \quad 10:00 \quad 11:00 \quad 12:00 \quad 1:00 \quad 1:40
   \end{array}\]
   Elapsed time:

3. Draw a timeline to find out how much time has elapsed between …
   a) 7:40 and 10:10
   b) 4:35 and 6:05
   c) 8:50 and 10:10
4. Draw a timeline to find the arrival time.
   a) Sun leaves home at 8:15 a.m. and walks 20 minutes to get to school.

   She arrives at ________.

   __________________________________________________________________________

   b) Ben leaves home at 8:25 a.m. He walks 10 minutes to the bus. The bus drives
   25 minutes to get to school.

   Ben arrives at school at ________.

   __________________________________________________________________________

   c) Emma wakes up at 6:30 a.m. She takes 15 minutes to eat breakfast, exercises
   for 1 hour, takes 35 minutes to shower, dress, and brush her teeth, and then takes
   another 25 minutes to get to school.

   Emma gets to school at ________.

   __________________________________________________________________________

5. The movie starts at 7:00 p.m. Will the student be on time? Estimate your answer,
   then use a timeline or add the times to check.

   a) Marla eats dinner at 6:00 p.m. It takes 25 minutes. Then she brushes her teeth
   for 5 minutes. She walks 5 minutes to the bus stop. She waits 5 minutes for the bus.
   The bus ride to the movie theatre takes 15 minutes.

   __________________________________________________________________________

   b) David leaves his home at 5:45 p.m. and walks 10 minutes to Ken’s. Ken takes
   5 minutes to get ready. Then they walk together 20 minutes to Hanna’s. Hanna is
   waiting outside when Ken and David arrive. All three walk 10 minutes to a pizzeria.
   They wait 10 minutes in line and then 5 minutes to get their pizza. They take
   15 minutes to eat their pizza. They then walk another 10 minutes to the movie theatre.

   __________________________________________________________________________

   c) Mary starts her homework at 11:00 a.m. She studies for 2 hours, then takes a
   90 minute break to have lunch and relax. Then she has dance class. Mary is home
   from dance class after 2 hours. Mary does 1 more hour of schoolwork before stopping
   for dinner. Helping with dinner, eating, and cleaning up takes 1 hour and 15 minutes.
   Her father takes 10 minutes to drive her to the movie theatre.

   __________________________________________________________________________
**G4-11 Triangular and Rectangular Prisms**

Prisms have two identical opposite faces called bases.

The bases of **triangular** prisms are triangles. The bases of **rectangular** prisms are rectangles.

On rectangular prisms, any pair of opposite faces can be called bases.

1. Shade the bases of the prism. Then name the prism.
   
   a)  
   
   b)  
   
   c)  
   
   d)  

   triangular  
   
   prism  

2. Cross out the objects that are not prisms. Shade the bases of the triangular prisms. Circle the rectangular prisms.

To make a skeleton of a prism:

**Step 1**
Make two copies of the same polygon using clay balls for vertices and toothpicks for edges. They are the bases of the prism.

**Step 2**
Add a toothpick to each vertex of one of the bases.

**Step 3**
Attach the other base on top of the toothpicks.


<table>
<thead>
<tr>
<th>Shape of Base</th>
<th>triangle</th>
<th>rectangle</th>
<th>square</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Vertices</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Edges</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Connect the matching vertices with edges to finish drawing the skeleton of the prism.

   a)  
   b)  
   c)  

5. Draw the skeleton of a rectangular prism by following these steps:

   **Step 1:** Draw the two identical rectangular bases, a little bit apart and to the side.

   **Step 2:** Connect the vertices of the bases in pairs: the bottom-left corner of one base goes to the bottom-left corner of the other, and so on.
### G4-13 Prisms

**REMINDER** ➤ Any polygon can be the base of a prism. Examples:

- Trapezoid-based prism
- Pentagon-based prism
- Hexagon-based prism

1. Shade a base of the prism. Then name the prism.

   a) [Image of a trapezoid-based prism]
   b) [Image of a pentagon-based prism]
   c) [Image of a hexagon-based prism]

   _________-based prism  _________-based prism  _________-based prism

   d) [Image of a trapezoid-based prism]
   e) [Image of a pentagon-based prism]
   f) [Image of a hexagon-based prism]

   _________-based prism  _________-based prism  _________-based prism

To make a skeleton of a prism:

**Step 1**
Make two copies of the same polygon using clay balls for vertices and toothpicks for edges. They are the bases of the prism.

**Step 2**
Add a toothpick to each vertex of one of the bases.

**Step 3**
Attach the other base on top of the toothpicks.

2. Build the skeletons of three prisms with the following bases: trapezoids, pentagons, and hexagons.
3. Use the skeletons you made in Question 2 to fill in the table.

<table>
<thead>
<tr>
<th>Shape of Base</th>
<th>Number of ...</th>
<th>Picture of Faces</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Vertices</td>
<td>Edges</td>
</tr>
<tr>
<td>trapezoid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>pentagon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>hexagon</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

4. Use pattern blocks to build a prism with a parallelogram as its base.
   
a) How many vertices does your prism have? _____
b) How many edges does your prism have? _____
c) How many faces does your prism have? _____
d) Draw the faces.

BONUS ➤ A prism has an 8-sided base.

   How many rectangular faces does the prism have? _____
   How many vertices does the prism have? _____
   How many edges does the prism have? _____
Pyramids have one base and a vertex opposite to the base. The bases of **triangular** pyramids are triangles. The bases of **rectangular** pyramids are rectangles.

Any face of a triangular pyramid can be called a base.

1. Shade the base and draw a dot on the vertex opposite the base. Then name the pyramid.
   a) ___________  b) ___________  c) ___________  d) ___________
   ![](image_a)   ![](image_b)   ![](image_c)   ![](image_d)
   **triangular** ___________  ___________  ___________  ___________
   **pyramid** ___________  ___________  ___________  ___________

2. Shade the base or bases. Then name the base and write “prism” or “pyramid.”
   a) ___________  b) ___________  c) ___________  d) ___________
   ![](image_a)   ![](image_b)   ![](image_c)   ![](image_d)
   ___________  ___________  ___________  ___________
   ___________  ___________  ___________  ___________

   e) ___________  f) ___________  g) ___________  h) ___________
   ![](image_e)   ![](image_f)   ![](image_g)   ![](image_h)
   ___________  ___________  ___________  ___________
A skeleton of a 3-D shape has only edges and vertices.
To make a skeleton of a pyramid:

**Step 1:** Make a polygon using clay balls for vertices and toothpicks for edges. The polygon is the base of the pyramid.

**Step 2:** Add a toothpick to each vertex.

**Step 3:** Join the loose toothpicks to make one vertex at the top.

3. a) Build the skeletons of three pyramids with the following bases: triangle, square, pentagon.

b) Sketch the skeletons of your pyramids by following these steps.

   **Step 1:** Draw the base.

   **Step 2:** Draw the extra vertex.

   **Step 3:** Connect the vertices of the base to the extra vertex.
4. a) Complete the table. Use actual 3-D shapes to help you.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Name of Shape</th>
<th>Number of …</th>
<th>Picture of Faces</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1.png" alt="Shape 1" /></td>
<td><img src="image2.png" alt="Name of Shape 1" /></td>
<td><img src="image3.png" alt="Number of Vertices" /></td>
<td><img src="image4.png" alt="Picture of Faces" /></td>
</tr>
<tr>
<td><img src="image5.png" alt="Shape 2" /></td>
<td><img src="image6.png" alt="Name of Shape 2" /></td>
<td><img src="image7.png" alt="Number of Vertices" /></td>
<td><img src="image8.png" alt="Picture of Faces" /></td>
</tr>
<tr>
<td><img src="image9.png" alt="Shape 3" /></td>
<td><img src="image10.png" alt="Name of Shape 3" /></td>
<td><img src="image11.png" alt="Number of Vertices" /></td>
<td><img src="image12.png" alt="Picture of Faces" /></td>
</tr>
<tr>
<td><img src="image13.png" alt="Shape 4" /></td>
<td><img src="image14.png" alt="Name of Shape 4" /></td>
<td><img src="image15.png" alt="Number of Vertices" /></td>
<td><img src="image16.png" alt="Picture of Faces" /></td>
</tr>
</tbody>
</table>

b) Circle the bases in the last column of the table.

c) The side faces of these pyramids are _______________________.

5. An object has a 7-sided base and 8 vertices. Is it a prism or a pyramid? Explain.

6. What 3-D shape can you make using only congruent triangles as faces?

**BONUS**

a) An object has 9 vertices and 16 edges. Is it a pyramid or a prism? How many sides does its base have?

b) An object has 14 vertices and 21 edges. Is it a pyramid or a prism? How many sides does its base have?
Volume is the amount of space taken up by a three-dimensional (or 3-D) object. These objects have a volume of 4 cubes.

1. Count the number of cubes to find the volume.
   a) 
   Volume = _____ cubes
   b) 
   Volume = _____ cubes
   c) 
   Volume = _____ cubes
   d) 
   Volume = _____ cubes
   e) 
   Volume = _____ cubes
   f) 
   Volume = _____ cubes
   g) 
   Volume = _____ cubes
   h) 
   Volume = _____ cubes
   i) 
   Volume = _____ cubes

2. How many cubes are in the shaded row?
   a) 
   _____ cubes
   b) 
   _____ cubes
   c) 
   _____ cubes

3. How many cubes are in the shaded layer?
   a) 
   _____ cubes
   b) 
   _____ cubes
   c) 
   _____ cubes
4. How many layers are there like the shaded layer?
   a) _____ layers  
   b) _____ layers  
   c) _____ layers

5. Multiply the number of blocks in the shaded layer by the number of layers to find the volume.
   a) Volume = _____ × _____ = _____ cubes  
   b) Volume = _____ × _____ = _____ cubes  
   c) Volume = _____ × _____ = _____ cubes  
   d) Volume = _____ × _____ = _____ cubes  
   e) Volume = _____ × _____ = _____ cubes  
   f) Volume = _____ × _____ = _____ cubes

6. Find the volume.
   a) Volume = _____ cubes  
   b) Volume = _____ cubes  
   c) Volume = _____ cubes