Quizzes and Tests: Grade 6—Ontario

JUMP Math 6.2

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Introduction to Quizzes and Tests

We provide a quiz for, on average, every four lessons and a test covering the material of two to three quizzes, with one or two tests per unit. Students should need no more than 10 minutes to complete a quiz and no more than 45 minutes to complete a test.

Quizzes cover material both from lessons that are required to cover the curriculum and lessons labelled as recommended, while tests only cover material from lessons that are required to cover the curriculum.

Quizzes can be used as confidence builders and as formative assessment tools. A quiz should be administered after the last lesson that it covers has been taught. Tests are intended to be used as summative assessment tools. We recommend allowing students time to receive and internalize the feedback from all relevant quizzes before administering the test. The introduction to each unit in the Teacher Resource identifies which lessons are covered by each quiz and test.
1. Fill in the blanks.
   a) 53 hundredths = ___ tenths ___ hundredths  b) 28 hundredths = ___ tenths ___ hundredths
      ____  = 0. ___ ___  ____  = 0. ___ ___

2. Express the value of the fraction in two different ways.
   a) \[
   \frac{43}{100} \quad ___ \text{tenths} \quad ___ \text{hundredths}
   \]
   b) \[
   \frac{7}{100} \quad ___ \text{tenths} \quad ___ \text{hundredths}
   
      _____ \text{hundredths}  
      _____ \text{hundredths}

3. Megan says that 0.31 is greater than 0.6 because 31 is greater than 6.
   Explain Megan’s mistake. __________________________________________________________
   _______________________________________________________________________________

4. Write the decimal as a sum of a whole number and decimal fractions.
   Do not write the fractions with a numerator of 0.
   a) 2.319 = 
   b) 5.047 =
   c) 0.105 =
   d) 3.002 =

5. Mark the decimal or fraction on the number line with a dot and letter.

   A. 2.7  B. \(\frac{18}{10}\)  C. 0.9  D. \(\frac{3}{10}\)  BONUS ➤ E. \(\frac{21}{10}\)

6. Write the numbers in order from least to greatest.
   a) 0.41  0.52  \(\frac{1}{2}\)  BONUS ➤  1  0.4  \(\frac{1}{3}\)
Unit 9: Number Sense

Quiz (Lessons 38–43) — ON

1. a) 5, 3
   \[
   \frac{53}{100}, 0.53
   \]
   b) 2, 8
   \[
   \frac{28}{100}, 0.28
   \]
2. a) 4, 3
   43
   b) 0, 7
   7
3. Megan did not consider the place value. There are 3 tenths in 0.31 and 6 tenths in 0.6, so 0.6 is greater.
4. a) \[2 + \frac{3}{10} + \frac{1}{100}\]
   \[+ \frac{9}{1000}\]
   b) \[5 + \frac{4}{100} + \frac{7}{1000}\]
   c) \[\frac{1}{10} + \frac{5}{1000}\]
   d) \[3 + \frac{2}{1000}\]
5. Teacher to check number line.
6. a) 0.41, \(\frac{1}{2}\), 0.52
   b) \(\frac{1}{3}\), 0.4, \(\frac{1}{2}\)
Unit 9: Number Sense

Quiz (Lessons 44–47) — ON

1. Add by adding each place value.
   a) 12.31 + 6.4
   b) 37.8 + 52.17

   Tens Ones Tenths Hundredths
   1 2 3 1
   + 6 4
   ______________________

   Tens Ones Tenths Hundredths
   3 7 8
   + 5 2 1 7
   ______________________

2. Zara adds 3.54 + 42.1 on grid paper. She gets 77.5. What mistake did she make? Explain.

3. Add or subtract mentally.
   a) 0.54 + 0.31 = ________  b) 4.95 − 2.84 = ________  c) 7.09 − 4.02 = ________
   d) 2.37 + 1.22 = ________  e) 5.73 − 1.62 = ________  f) 6.73 − 2.53 = ________
   g) 6.32 + 2.54 = ________  h) 4.35 − 2.12 = ________  i) 9.47 − 7.46 = ________

4. Ken made punch by mixing 0.45 L of juice with 0.37 L of ginger ale. How many litres of punch did he make?

5. Armand has $31.50. If he buys a pair of shoes for $16.25 and a shirt for $10.50, will he have enough money left to buy another shirt at the same price?

   BONUS  The seller offered Armand $5.25 off for the second shirt. Will Armand have enough money left to buy the shirt after the discount?
1. a) 18.71  
   b) 89.97  
2. Zara did not line up the decimals properly.  
   She added: 
   \[
   \begin{array}{c}
   3 \quad 5 \quad 4 \\
   + \quad 4 \quad 2 \quad 1 \\
   \hline 
   7 \quad 7 \quad 5 
   \end{array}
   \]
3. a) 0.85  
   b) 2.11  
   c) 3.07  
   d) 3.59  
   e) 4.11  
   f) 4.2  
   g) 8.86  
   h) 2.23  
   i) 2.01  
4. 0.82 L  
5. $31.50 − $16.25 − $10.50 = $4.75. He does not have enough for another shirt.  
   BONUS  
   $10.50 − $5.25 = $5.25. He does not have enough for another shirt because he only has $4.75 left.
1. Write the decimal as a sum of a whole number and decimal fractions. Do not write the fractions with a numerator of 0.
   
   a) 3.504  
   b) 8.15  
   c) 2.009  
   d) 0.087  

2. Mark the decimal or fraction on the number line with a dot and letter.

   A. 0.21  
   B. 0.18  
   C. \(\frac{14}{100}\)  
   D. 0.07  
   BONUS ▶ E. \(\frac{3}{10}\)  

3. Write the numbers in order from least to greatest.
   
   a) 32.9  3.92  3.902  
   b) 1.010  0.110  0.011  

4. Add the decimals by lining up the decimal points. You will need to regroup.
   
   a) 0.51 + 0.6  
   b) 1.47 + 0.35  
   BONUS ▶ 0.23 + 2.49 + 1.16  

5. Jasmin bought a pair of running shoes for $34.50 and a shirt for $17.99. How much money did she spend in total?
6. Round the number to the given digit. Regroup if necessary.
   a) 4.296 hundredths ___________
   b) 3.95 tenths ___________
   c) 2.972 tenths ___________
   **BONUS** 7.996 hundredths ___________

7. Estimate the sum or difference using the whole-number parts of the decimals.
   a) 2.356 + 5.602 ≈ _____ + _____ = _____
   **BONUS** 11.501 + 2.48 − 3.61 ≈ _____ + _____ − _____ = _____

8. Use all the digits 1, 5, 6, and 9 once to write a number between the given numbers.
   a) 1.596 < _________ < 1.695
   b) 6.159 < _________ < 6.519
   c) 9.561 < _________ < 9.651

9. The decimal hundredths that could be rounded to 3.2 are from 3.15 to 3.24. Which decimal hundredths could be rounded to 6.1? Explain how you know.

**BONUS** Which decimal hundredths could be rounded to 5.0?
1. a) \[3 + \frac{5}{10} + \frac{4}{1000}\]
b) \[8 + \frac{1}{10} + \frac{5}{100}\]
c) \[2 + \frac{9}{1000}\]
d) \[\frac{8}{100} + \frac{7}{1000}\]

2. Teacher to check number line.

3. a) 3.902, 3.92, 32.9
b) 0.011, 0.110, 1.010

4. a) 1.11
b) 1.82

BONUS
3.88

5. $52.49

6. a) 4.30
b) 4.0
c) 3.0

BONUS
8.00

7. a) 2 + 6 = 8

BONUS
12 + 2 − 4 = 10

8. a) 1.659
b) 6.195
c) 9.615

9. 6.05 to 6.14
Sample explanation: All numbers above 6.05 would be rounded up to 6.1, and all numbers below 6.14 would be rounded down to 6.1.

BONUS
4.95 to 5.04
1. a) To multiply by 10, I move the decimal point ____ place(s) to the _________.
   b) To multiply by 1000, I move the decimal point ____ place(s) to the _________.
   c) To divide by 100, I move the decimal point ____ place(s) to the _________.
   d) To ____________ by 1000, I move the decimal point ____ place(s) to the left.
   e) To ____________ by 100, I move the decimal point ____ place(s) to the right.

2. Multiply each digit separately. Remember to include the decimal point.
   a) 2.3 × 3 = ______  b) 7.1 × 5 = ______  c) 3.2 × 4 = ______  d) 12.4 × 2 = ______
   e) 43.2 × 3 = ______  f) 71.2 × 4 = ______  g) 61.1 × 5 = ______  h) 322.3 × 3 = ______

3. A nickel is 21.2 mm wide. What is the total width of 5 nickels placed side by side?

4. A square has sides of 5.3 cm. What is its perimeter?

BONUS ➤ Which has a bigger perimeter: a pentagon with sides of 12.3 m or a hexagon with sides of 10.2 m?
Unit 10: Number Sense
Quiz (Lessons 48–50) — ON

1. a) 1, right  
b) 3, right  
c) 2, left  
d) divide, 3  
e) multiply, 2  

2. a) 6.9  
b) 35.5  
c) 12.8  
d) 24.8  
e) 129.6  
f) 284.8  
g) 305.5  
h) 966.9  

3. 21.2 × 5 = 106.0  
5 nickels are 106 mm wide.  

4. 5.3 × 4 = 21.2  
The perimeter is 21.2 cm.  

BONUS  
Pentagon:  
12.3 × 5 = 61.5 m  

Hexagon:  
10.2 × 6 = 61.2 m  
The pentagon has a bigger perimeter.
Unit 10: Number Sense

Quiz (Lessons 52, 54–56) — ON

Name: ______________________

Date: ________________

1. Divide mentally.
   a) \( 4.2 \div 2 = \) _______
   b) \( 96.3 \div 3 = \) _______
   c) \( 0.48 \div 4 = \) _______

2. Divide using long division. Hint: Circle the first part of the dividend that is at least as big as the divisor.
   a) \( 471 \div 30 \)
   b) \( 925 \div 53 \)
   BONUS ▶ \( 1493 \div 26 \)

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Unit 10: Number Sense

Quiz (Lessons 52, 54–56) — ON

1. a) 2.1  
b) 32.1  
c) 0.12

2. a) \[
\begin{array}{c}
15 \\
\hline
30 \\
-171 \\
150 \\
-21 \\
\hline
15 \text{ R } 21
\end{array}
\]
b) \[
\begin{array}{c}
17 \\
\hline
53 \\
-395 \\
371 \\
-24 \\
\hline
17 \text{ R } 24
\end{array}
\]

BONUS

\[
\begin{array}{c}
57 \\
\hline
26 \\
1493 \\
130 \\
193 \\
182 \\
11 \\
\hline
57 \text{ R } 11
\end{array}
\]

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Unit 10: Number Sense

Test (Lessons 48–50, 52, 54–56) — ON

Name: ______________________
Date: ________________

1. a) To divide by 10, I move the decimal point ____ place(s) to the _________.
   b) To divide by 1000, I move the decimal point ____ place(s) to the _________.
   c) To multiply by 100, I move the decimal point ____ place(s) to the _________.
   d) To ________ by 10, I move the decimal point ____ place(s) to the right.
   e) To ________ by 100, I move the decimal point ____ place(s) to the left.

2. Multiply each digit separately. Remember to include the decimal point.
   a) 4.1 × 2 = ______
   b) 1.1 × 8 = ______
   c) 7.2 × 4 = ______
   d) 41.2 × 2 = ______
   e) 51.3 × 3 = ______
   f) 13.3 × 3 = ______
   g) 733.2 × 3 = ______  BONUS ▶ 4.321 × 3 = ______

3. A mile is about 1.6 kilometres. Is 12 miles more than 20 km?

4. Divide using long division. Hint: Circle the first part of the dividend that is at least as big as the divisor.
   a) 732 ÷ 20
   b) 461 ÷ 32
   BONUS ▶ 2351 ÷ 39
5. Amy lives 1.3 km from school. She walks to school and back every weekday (5 days per week). How many kilometres does she walk to and from school in a week?

BONUS ▶ Explain how you can find the answer to Question 5 using mental math.
1. a) 1, left
   b) 3, left
   c) 2, right
   d) multiply, 1
   e) divide, 2
2. a) 8.2
   b) 8.8
   c) 28.8
   d) 82.4
   e) 153.9
   f) 39.9
   g) 2199.6
   BONUS
      12.963
3. 12 \times 1.6 = 19.2
   12 miles is less than 20 km.
4. a) \[
\begin{array}{c}
36 \\
20 \overline{732} \\
60 \\
132 \\
120 \\
12 \\
36 R 12
\end{array}
\]
   b) \[
\begin{array}{c}
14 \\
32 \overline{461} \\
32 \\
141 \\
128 \\
13 \\
14 R 13
\end{array}
\]
   c) \[
\begin{array}{c}
60 \\
39 \overline{2351} \\
234 \\
11
\end{array}
\]
   60 R 11
5. 1.3 \times 2 = 2.6
   2.6 \times 5 = 13
   She walks 13 km in a week.
   BONUS
   Amy walks the distance to or from school 10 times a week. 1.3 \times 10 = 13, so she walks 13 km in a week.
Unit 11: Geometry
Quiz (Lessons 13–16) — ON

1. a) Predict the result of combining two translations:
   P to P': 5 units left and 3 units up
   P' to P*: 2 units right and 4 units up
   P to P*: ____ units ____________ and
   ____ units ____________

   b) Translate P to P’ and P’ to P* to check your prediction. Was your prediction correct?
   __________

   BONUS ➤ Draw a shape congruent to P that is not a translation of P. Explain how you know it is not a translation of P.

2. a) Reflect triangle R in line ℓ. Label the image R'.

   b) Reflect triangle R' in line m. Label the image R*.

   c) Is there a reflection or a translation that takes R to R*? If yes, describe it.

3. a) Rotate polygon M 180° clockwise around point O. Label the image M'.

   b) Rotate polygon M' 90° clockwise around point O. Label the image M*.

   c) Which rotation around point O takes polygon M to polygon M*?
Unit 11: Geometry

Quiz (Lessons 13–16) — ON

1. a) 3, left
    7, up
b) Teacher to check.

BONUS

Teacher to check drawing.
Sample explanation:
Translated shapes point the same way.
The new shape does not point the same way as P.

2. a) Teacher to check.
b) Teacher to check.
c) Translation 8 units right.

3 a) Teacher to check.
b) Teacher to check.
c) 270° CW or 90° CCW
Unit 11: Geometry

Quiz (Lessons 17–20) — ON

1. a) Continue the pattern.

```
1  2  3  4  5  6  7  8
```

b) This pattern is made by repeating the same type of transformation. Identify the transformation used. Draw the mirror line, the translation arrows, or centres of rotation between each polygon and the next.

BONUS  Describe a different way to create the same pattern. Use a different transformation or combination of transformations to get from each polygon to the next.

5 to 6:
6 to 7:

2. a) Reflect triangle \(DEF\) in the given line.
Write the coordinates of the vertices before and after the reflection.

\[
D (___, ___) \rightarrow D' (___, ___) \\
E (___, ___) \rightarrow E' (___, ___) \\
F (___, ___) \rightarrow F' (___, ___)
\]

b) Rotate the triangle \(D'E'F'\) around the point \((8, 3)\) clockwise 90°. Write the coordinates of the vertices after the rotation.

\[
D' \rightarrow D'' (___, ___) \\
E' \rightarrow E'' (___, ___) \\
F' \rightarrow F'' (___, ___)
\]

3. Plot and label the points on the coordinate grid in Question 2.

\(A (4, 0), B (0, 3), C (7, 6)\)
Unit 11: Geometry
Quiz (Lessons 17–20) — ON

1. a) Teacher to check.
   b) Teacher to check.
      There should be a 90° CCW rotation around a marked point between the polygons.

BONUS

Sample answers:
5 to 6: Reflect 5 in the vertical line on the right side of the figure.
6 to 7: Reflect 6 in the bottom horizontal line, then translate image 2 units right and 2 units up.

2. a) Teacher to check reflection.
   \[D (4, 3) \rightarrow D' (8, 3)\]
   \[E (1, 5) \rightarrow E' (11, 5)\]
   \[F (2, 7) \rightarrow F' (10, 7)\]
   b) Teacher to check rotation.
   \[(8, 3)\]
   \[(10, 0)\]
   \[(12, 1)\]

3. Teacher to check.
1. a) Draw a rectangle around the smallest part that is transformed to create the pattern.

![Pattern Diagram]

b) Describe the transformations used to create the pattern.

2. a) Reflect triangle $DEF$ in the given line. Write the coordinates of the vertices before and after reflection.

$D (____,____) \rightarrow D' (____,____)$

$E (____,____) \rightarrow E' (____,____)$

$F (____,____) \rightarrow F' (____,____)$

b) Rotate triangle $D'E'F'$ around the point $(9, 3)$ $180^\circ$ clockwise. Write the coordinates of the vertices after the rotation.

$D' \rightarrow D'' (____,____) \quad E' \rightarrow E'' (____,____) \quad F' \rightarrow F'' (____,____)$

c) What transformation takes $DEF$ to $D''E''F''$?

**BONUS** Which vertex of $DEF$ goes to which vertex of $D''E''F''$ under the transformation in part c)?

$D \rightarrow ____ \quad E \rightarrow ____ \quad F \rightarrow ____$

3. Plot and label the points on the coordinate grid in Question 2.

$A (5, 0), B (0, 1), C (7, 6)$

**BONUS** Draw two congruent shapes A and B so that there is no single translation, reflection, or rotation that takes A to B. Describe the sequence of transformations that takes A to B.
Unit 11: Geometry

Test (Lessons 13–20) — ON

1. Answers will vary. Sample answers:
   a) Draw a rectangle at top left:

   

   b) Reflect the rectangle in the horizontal line through the bottom side. Reflect the original and the image in the line through the right side of both rectangles. Translate all 4 rectangles right repeatedly.

2. a)  
   \[ D (4, 4) \rightarrow D' (6, 4) \]
   \[ E (1, 2) \rightarrow E' (9, 2) \]
   \[ F (1, 6) \rightarrow F' (9, 6) \]

   b)  
   \[ D'' (12, 2) \]
   \[ E'' (9, 4) \]
   \[ F'' (9, 0) \]

   c) Translate DEF 8 units right, 2 units down.

   **BONUS**

   \[ D''', F''', E''' \]

3. Teacher to check.

   **BONUS**

   Answers will vary. Teacher to check.
1. Find the number that makes the equation true.
   a) ____ + 4 = 7    b) ____ ÷ 5 = 3    c) 3 × ____ = 12    BONUS► 5 + 7 = 6 + ____

2. Let x stand for the number of bananas in each bag. Write an equation to find x.
   a) 7 bananas in total                      b) 14 bananas in total
   
   ![Banana Bags]

   Equation _______________                     Equation _______________
   ____ bananas in each bag                        ____ bananas in each bag

3. Use the picture to explain why you can divide both sides by 4 to solve the equation 4 × b = 8.

   ______________________________________

   ______________________________________

   ______________________________________

4. Solve for x by doing the same thing to both sides of the equation (preserve equality).
   Check your answer.
   a) x − 6 = 25    b) 5x = 45    c) 7 = x ÷ 3    BONUS► 12 + x = 15 + 12
Unit 12: Patterns and Algebra

Quiz (Lessons 9–11) — ON

1. a) 3
   b) 15
   c) 4

   **BONUS**
   6

2. a) $3x + 1 = 7$
   \[ \frac{2}{2} \]
   b) $4x + 2 = 14$
   \[ \frac{3}{3} \]

3. Each side is divided into 4 groups. $8 \div 4 = 2$, so $4 \times 2 = 8$, so $b = 2$. There are 2 apples in each bag.

4. a) $x - 6 + 6 = 25 + 6$
   \[ x = 31 \]
   \[ 31 - 6 = 25 \checkmark \]
   b) $5x + 5 = 45 + 5$
   \[ x = 9 \]
   \[ 5 \times 9 = 45 \checkmark \]
   c) $7 \times 3 = x + 3 \times 3$
   \[ 21 = x \]
   \[ 7 = 21 + 3 \checkmark \]

   **BONUS**
   \[ 12 + x - 12 = 15 + 12 - 12 \]
   \[ x = 15 \]
   \[ 12 + 15 = 15 + 12 \checkmark \]
1. Susan’s solution for \( x + 44 = 55 \) is shown below. Explain how Susan used logic to solve the equation.

\[
x + 44 = 55 \\
x = 55 - 44 \\
x = 11
\]

2. a) Circle the total in the story. Then write an equation and solve for \( x \).

10 boys
\( x \) girls
21 girls and boys altogether

b) Circle the part that is larger in the story. Write the difference in two ways to make an equation and solve for \( x \).

There are 12 pens.
There are 3 more pencils than pens.
There are \( x \) pencils.

3. Replace \( n \) with 5 and say whether 5 is too high or too low. Then try a lower or higher number.

a) \( 4n + 1 = 25 \)

\[
\begin{array}{|c|c|c|}
\hline
n & 4n + 1 & \text{Answer} \\
\hline
5 & & \text{ } \\
\hline
\end{array}
\]

b) \( 3n - 4 = 8 \)

\[
\begin{array}{|c|c|c|}
\hline
n & 3n - 4 & \text{Answer} \\
\hline
5 & & \text{ } \\
\hline
\end{array}
\]

4. Amy is 4 times as old as her brother. Amy is 6 years older than her brother. Finish the model below to find out how old Amy is.

BONUS► Solve the equation and check your answer.

\[
27 - x = 19
\]
1. \(x + 44 = 55\) means Susan has to add 44 to \(x\) to get 55, so she has to subtract 44 from 55 to find \(x\).

2. a) circle “21 boys and girls”
   \[10 + x = 21\]
   \[x = 11\]
   b) circle “\(x\) pencils”
   \[x - 3 = 12\]
   \[x - 12 = 3\]
   \[x = 15\]

3. a) \[
   \begin{array}{ccc}
   5 & 4(5) + 1 & 21 \\
   6 & 4(6) + 1 & 25 \\
   \end{array}
   
   5 is too low.
   
   b) \[
   \begin{array}{ccc}
   4 & 3(4) - 4 & 8 \\
   5 & 3(5) - 4 & 11 \\
   \end{array}
   
   5 is too high.

4. \[
   \begin{array}{cccc}
   2 & 2 & 2 & 2 \\
   \end{array}
   
   \begin{array}{c}
   2 \\
   6 \\
   \end{array}
   
   Amy is 8 years old.

BONUS

\[
27 - x = 19
\]
\[
27 - x + x = 19 + x
\]
\[
27 = 19 + x
\]
\[
27 - 19 = 19 + x - 19
\]
\[
x = 8
\]
Unit 12: Patterns and Algebra
Quiz (Lessons 16–18) — ON

1. Graph the sequence of numbers by first making a list of ordered pairs.
   a) 13, 10, 7, 4
   b) 2, 4, 10, 11
   c) 0, 3, 6, 13

   (1,   ), (2,   ), (3,   ), (4,   )
   (1,   ), (2,   ), (3,   ), (4,   )
   (1,   ), (2,   ), (3,   ), (4,   )

2. The graph shows the cost of renting a scooter from Bernard’s store.
   a) What is the independent variable? ________________
      What is the dependent variable? ________________
   b) Write a list of ordered pairs for the graph.
   c) How much would you pay to ride a scooter for …
      1 hour? _____    2 hours? _____    4 hours? _____
   d) How much do you have to pay for the scooter before
      you have even ridden it? _____
Unit 12: Patterns and Algebra

Quiz (Lessons 16–18) — ON

1. a) (1, 13), (2, 10), (3, 7), (4, 4)

   ![Graph](image1)

b) (1, 2), (2, 4), (3, 10), (4, 11)

   ![Graph](image2)

c) (1, 0), (2, 3), (3, 6), (4, 13)

   ![Graph](image3)

2. a) Time
   Total Cost

<table>
<thead>
<tr>
<th>Time</th>
<th>Total Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>1</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
</tr>
<tr>
<td>4</td>
<td>15</td>
</tr>
</tbody>
</table>

b) (0, 3), (1, 6), (2, 9), (3, 12), (4, 15)

c) $6, $9, $15

d) $3
1. Solve for $x$ by doing the same thing to both sides of the equation (preserve equality).
   Check your answer.
   a) $x - 7 = 15$  
   b) $7x = 35$  
   c) $x ÷ 4 = 9$

2. Circle the part that is larger in the story. Write the difference in two ways to make an equation and solve for $x$.
   a) There are 16 pens.  
   b) There are 9 boys.  
   BONUS► 3 more red apples than green apples
   There are 4 more pencils than pens.  
   There are $x$ girls.  
   There are 5 more girls than boys.  
   There are $x$ pencils.

3. Solve the equation using logic. Check your answer.
   a) $x + 8 = 12$  
   b) $9 - x = 7$  
   BONUS► $35 ÷ x = 7$

4. Dory watched TV for 40 minutes. She spent 12 minutes less on her homework than on watching TV. How much time did Dory spend on homework? Write and solve an equation.

5. Write an equation for the story. Replace the correct letter with the given quantity.
   Use $c$ for children and $a$ for adults.
   a) There are 3 times as many children as there are adults. There are 5 adults.
   $c = ____a$, so $c = _________$
   _________, so ______________
   BONUS► Amit is twice as old as Jack. Clara is 3 years older than Jack. Amit is 12 years old.
   How old are Jack and Clara? Write equations and solve.
Unit 12: Patterns and Algebra

Test (Lessons 9–18) — ON

6. Graph the sequence of numbers by first making a list of ordered pairs.
   a) 5, 7, 9, 11
   b) 12, 9, 6, 1
   c) 0, 5, 7, 12

   (1, ), (2, ), (3, ), (4, )

   (1, ), (2, ), (3, ), (4, )

   (1, ), (2, ), (3, ), (4, )

7. The graph shows the growth of a guinea pig in the first year after birth.
   a) What is the independent variable? ________________
      What is the dependent variable? ________________
   b) Write a list of ordered pairs for the graph.
   c) What is the weight of the guinea pig after ...
      6 months? ______ 3 months? ______  a year? ______
   d) What is the weight of the guinea pig at birth? ______
1. a) \( x - 7 + 7 = 15 + 7 \)
   \( x = 22 \)
   \( 22 - 7 = 15 \checkmark \)
   b) \( 7x + 7 = 35 + 7 \)
   \( x = 5 \)
   \( 7 \times 5 = 35 \checkmark \)
   c) \( x + 4 \times 4 = 9 \times 4 \)
   \( x = 36 \)
   \( 36 + 4 = 9 \checkmark \)
2. a) circle "x pencils"
   \( x - 16 = 4 \)
   \( x = 20 \)
   b) circle "x girls"
   \( x - 9 = 5 \)
   \( x = 14 \)
   BONUS
   circle "5 red apples"
   \( 5 - x = 3 \)
   \( x = 2 \)
3. a) \( x = 12 - 8 \)
   \( x = 4 \)
   \( 4 + 8 = 12 \checkmark \)
   b) \( 9 - 7 = x \)
   \( x = 2 \)
   \( 9 - 2 = 7 \checkmark \)
   BONUS
   \( x = 35 + 7 \)
   \( x = 5 \)
   \( 35 + 5 = 7 \checkmark \)
4. \( 40 - x = 12 \)
   \( x = 40 - 12 \)
   \( x = 28 \)
   Dory spent 28 minutes on homework.
5. a) \( 3a, 3 \times 5 = 15 \)
   b) \( a = 4c, 12 = 4c, c = 3 \)
   BONUS
   \( A = 2J \) and \( A = 12 \), so \( J = 6 \)
   \( C = J + 3 = 6 + 3 \), so \( C = 9 \)
6. a) \( (1, 5), (2, 7), (3, 9), (4, 11) \)
   c) \( 250 \text{ g}, 175 \text{ g}, 300 \text{ g} \)
   d) \( 50 \text{ g} \)
   b) \( (1, 12), (2, 9), (3, 6), (4, 1) \)
   c) \( (1, 0), (2, 5), (3, 7), (4, 12) \)
7. a) Age
   Mass
   b) \( (0, 50), (3, 175), (6, 250), (9, 275), (12, 300) \)
1. Find the area of the rectangle using the length and the width. Include the units.
   a) Length = 12 cm    b) Width = 3.2 m
   Width = 8 cm          Length = 7 m
   Area = ______________       Area = _______________

2. a) Estimate the length and the width of the rectangle in centimetres.
    Then estimate the area. Record your estimates in the table.

<table>
<thead>
<tr>
<th>Estimate</th>
<th>Width</th>
<th>Area</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Actual value</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b) Measure the length and the width of the rectangle. Record the measurements
to the nearest tenth of a centimetre in the table. Calculate the area.

3. a) Draw two rectangles on the grid with the same perimeter but different areas.

   b) Ivan thinks that a rectangle with larger area always has a larger perimeter. Is he correct? Explain.

BONUS ► Each square on the grid is 3 cm long. Find the perimeter and the area of the shape.
Unit 13: Measurement
Quiz (Lessons 8–10) — ON

1. a) 96 cm$^2$
   b) 22.4 m$^2$

2. a) Estimates will vary.
   Teacher to check.
   b) 3.3 cm, 3 cm,
      9.9 cm$^2$

3. a) Answers will vary.
   Teacher to check.
   b) Ivan is not correct.
   Teacher to check
   that the explanation
   refers to the
   rectangles drawn in
   part a).

BONUS
   Perimeter = 54 cm
   Area = 108 cm$^2$
1. Find the area of the parallelogram given the base and height. Include the units.
   a) Base = 15 cm  
      Height = 8 cm  
      Area = ____________
   b) Base = 23.5 m  
      Height = 16 m  
      Area = ____________

2. a) Estimate the base and the height of the parallelogram in centimetres.
    Then estimate the area. Record your estimates in the table.

    | Length | Width | Area |
    |--------|-------|------|
    | Estimate |       |      |
    | Actual value | |      |

   b) Measure the base and the height of the parallelogram. Record the
   measurements to the nearest tenth of a centimetre in the table. Then
   calculate the area.

3. Find the area of the triangle.
   a)  
      3 cm  
      4.6 cm  
      Area = ________________
   b)  
      5 m  
      9 m  
      Area = ________________

BONUS ► Draw two different triangles with the same area on the grid. Explain
how you know that they have the same area.
Unit 13: Measurement
Quiz (Lessons 11–13) — ON

1. a) 120 cm²
   b) 376 m²

2. a) Estimates will vary.
    Teacher to check.
   b) 2.8 cm
      4 cm
      11.2 cm²

3. a) 6.9 cm²
   b) 22.5 m²

BONUS

Triangles will vary.
Teacher to check.
Sample explanation: The triangles have the same base and the same height, so they must have the same area.
Unit 13: Measurement

Quiz (Lessons 15, 16) — ON

1. A company logo is a parallelogram with base 70 cm. It covers an area of 4200 cm². What is the height of the parallelogram?
   
   Base = _______  
   Equation: _____________________
   Height = _______  
   Area = ____________  
   Formula: _____________________________

2. Convert the measurement.
   
   a) 2.51 m = __________ cm  
   b) 3.8 m = __________ cm  
   c) 0.96 m² = __________cm²

3. A flower bed is a rectangle with area 2.4 m². Its width is 80 cm. How long is the flowerbed?

4. Find the area of the shaded polygon.

   BONUS► Erica thinks that the area of the rectangle is 270 cm². Is she correct? Explain
Unit 13: Measurement
Quiz (Lessons 15, 16) — ON

1. 70 cm
   \[ h \]
   \[ 4200 \text{ cm}^2 \]
   Area = \( b \times h \)
   \[ 4200 = 70 \times h \]
   \[ h = 60 \text{ cm} \]

2. a) 251
    b) 380
    c) 9600

3. Sample solution:
   \[ 2.4 \text{ m}^2 = 24000 \text{ cm}^2 \]
   \[ 24000 \text{ cm}^2 = \ell \times 80 \text{ cm} \]
   \[ \ell = 300 \text{ cm} \]
   The flower bed is 300 cm, or 3 m, long.

4. Area of rectangle
   \[ = 80 \text{ cm} \times 275 \text{ cm} \]
   \[ = 22000 \text{ cm}^2 \]
   Area of triangle
   \[ = (275 \text{ cm} - 175 \text{ cm}) \times 120 \text{ cm} ÷ 2 \]
   \[ = 6000 \text{ cm}^2 \]
   Total area = 22000 + 6000
   \[ = 28000 \text{ cm}^2 \]

**BONUS**

Erica is not correct.

Sample explanation: The side lengths must be the same unit before multiplying them. The area of the rectangle is 300 cm
\[ \times 90 \text{ cm} = 27000 \text{ cm}^2 \]
Unit 13: Measurement

Test (Lessons 9, 11–13, 15, 16) — ON

Name: ______________________  Date: ______________

1. Find the area of the polygon. Include the units.
   a) Rectangle   b) Parallelogram   c) Triangle
      Length = 11 cm  Base = 3.2 m  Base = 2.4 cm
      Width = 9 cm  Height = 5 m  Height = 2 cm
      Area = ______________  Area = ______________  Area = ______________

2. a) Estimate the length and the width of the rectangle in centimetres.
    Then estimate the area. Record your estimates in the table.

    | Length | Width | Area |
    |--------|-------|------|
    | Estimate |       |      |
    | Actual value | |      |

   b) Measure the length and the width of the rectangle. Record the measurements to the nearest tenth of a centimetre in the table. Calculate the area.

3. a) Draw two rectangles on the grid with the same area but different perimeters.

   b) Joan thinks that a rectangle with smaller perimeter always has a smaller area. Is she correct? Explain.

4. Measure the base and the height of the triangle. Record the measurements to the nearest tenth of a centimetre. Then calculate the area.
BONUS ▶ Draw two different parallelograms with the same area on the grid. Explain how you know that they have the same area.

5. Convert the measurement.
   a) $4.01 \text{ m} = \underline{\underline{\text{ } \text{ cm}}}$  b) $0.8 \text{ m} = \underline{\underline{\text{ } \text{ cm}}}$  c) $1.9 \text{ m}^2 = \underline{\underline{\text{ } \text{ cm}^2}}$

6. A company logo is a rectangle with length 35 cm. It covers an area of $0.021 \text{ m}^2$. What is the width of the rectangle? Show your work.

7. Find the area of the shaded shape.
Unit 13: Measurement

Test (Lessons 9, 11–13, 15, 16) — ON

1. a) 99 cm²
   b) 16 m²
   c) 2.4 cm²

2. a) Estimates will vary.
      Teacher to check.
   b) 4.3 cm, 2 cm, 8.6 cm²

3. a) Rectangles will vary.
      Teacher to check.
   b) Teacher to check that the explanation refers to the rectangles drawn in part a).

4. Base = 5 cm
   Height = 2.4 cm
   Area = 6 cm²

BONUS
   Teacher to check parallelogram.
   Sample explanation: The parallelograms have the same base and the same height, so they must have the same area.

5. a) 401
   b) 80
   c) 19 000

6. 0.021 m² = 210 cm²
   210 cm² = 35 cm × w
   w = 6 cm

7. Area of parallelogram
   = 125 cm × 60 cm
   = 7500 cm²
   Area of triangle
   = 125 cm × 70 cm + 2
   = 4375 cm²
   Total area = 7500 + 4375
   = 11 875 cm²
Unit 14: Number Sense

Quiz (Lessons 58–63) — ON

1. Find the missing term(s).
   a) 5 : 8 = ____ : 16
   b) 4 : 7 = 12 : ____
   c) 2 : 3 = 10 : ____ = ____ : 24

2. A team has 3 wins for every loss. They won 12 games. Use equivalent ratios to find how many games they lost.

  **BONUS** How many games would they need to play to have 18 wins?

3. Is the table a ratio table? Explain how you know.
   a) ______________________
      ______________________
      ______________________
      ______________________
   b) ______________________
      ______________________
      ______________________
      ______________________

4. On a map, 3 cm represent 10 km in real life. If the distance between two cities is 15 cm on the map, what is the actual distance between the cities? Use a ratio table to solve.

5. Find the unit rate.
   a) 4 eggs for 12 cups of flour
   **BONUS** 3 bottles of water cost $1.47. How much
   1 egg for ____ cups of flour
   is 1 bottle of water? _________
Unit 14: Number Sense

Quiz (Lessons 58–63) — ON

1. a) 10
   b) 21
   c) 15, 16
2. 4 games
   BONUS
      24 games
3. a) It is not a ratio table because the ratios in the rows are not equivalent.
   b) It is a ratio table because the ratios in the rows are equivalent.
4. 50 km
5. a) 3
   BONUS
      $0.49 or 49¢
1. Circle whether the mark is closer to 25%, 50%, or 75%.
   
   a) ![Mark closer to 75%]
   b) ![Mark closer to 50%]
   c) ![Mark closer to 25%]
   d) ![Mark closer to 75%]

2. Shade the given percentage of the shape.
   
   a) 50%  
      ![Shaded rectangle for 50%]
   b) 25%  
      ![Shaded square for 25%]
   c) 50%  
      ![Shaded triangle for 50%]
   d) 25%  
      ![Shaded rectangle for 25%]

3. Change the numbers in the pair to fractions with the same denominator. Then write <, >, or = in the box.
   
   a) $\frac{1}{2}$ 39%  
      ![Blank space for comparison]
   b) $\frac{3}{4}$ 78%  
      ![Blank space for comparison]
   c) $\frac{3}{5}$ 60%  
      ![Blank space for comparison]
   d) 26% $\frac{7}{25}$  
      ![Blank space for comparison]

4. Marko has 50 stickers and 26 of them are hockey stickers. About what percentage of Marko’s stickers are hockey stickers?

   **BONUS** ▶ Marko has 12 baseball stickers. About what percentage of Marko’s stickers are baseball stickers?
Unit 14: Number Sense

Quiz (Lessons 64–67) — ON

1. a) 75%
   b) 50%
   c) 25%
   d) 75%

2. Teacher to check.

3. a) >
   b) <
   c) =
   d) <

4. about 50%

BONUS
   about 25%
1. In a Grade 6 class, 30% of students bike to school, \(\frac{1}{5}\) of the students come to school by car or bus, and the rest walk to school. What percentage of students walk to school?

2. a) A test has 25 multiple choice questions. Alexa answered 18 questions correctly. What percentage mark did she get on the test?

b) Ben answered 17 questions correctly. What percentage mark did Ben get on the test?

BONUS Don wants to get 80% or higher on the test. At least how many questions does Don have to answer correctly?

3. There are 20 marbles in a jar. There are 6 red marbles, half of the marbles are green, and 20% of the marbles are blue. Complete the chart.

<table>
<thead>
<tr>
<th>Number of Marbles</th>
<th>Percentage of Marbles</th>
<th>Fraction of Marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Green</td>
<td></td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>Blue</td>
<td>20%</td>
<td></td>
</tr>
</tbody>
</table>
1. 50%
2. a) 72%
   b) 68%
   BONUS
   at least 20 questions
3. |   |   |   |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>30%</td>
<td>(\frac{3}{10})</td>
</tr>
<tr>
<td>10</td>
<td>50%</td>
<td>(\frac{1}{2})</td>
</tr>
<tr>
<td>4</td>
<td>20%</td>
<td>(\frac{1}{5})</td>
</tr>
</tbody>
</table>
1. To make fruit salad, Simon needs 3 cups of bananas, 1 cup of pineapple, 1 cup of mango, and 2 cups of oranges.
   a) How many cups of fruit does Simon in total? ______  
   b) What is the ratio of cups of oranges to cups of fruit salad? ______ : ______  

2. Is the table a ratio table? Explain how you know.
   a) _________________________  
   b) _________________________  
   _________________________  
   _________________________  
   _________________________  
   _________________________  
   _________________________  
   _________________________  
   _________________________  

3. Change the numbers in the pair to fractions with the same denominator. Then write <, >, or = in the box.
   a) \( \frac{1}{4} \) 28%  
   b) 37% \( \frac{2}{5} \)  
   c) \( \frac{3}{4} \) 75%  
   BONUS ► 67% \( \frac{2}{3} \)  

4. Kate has 60 stickers and 17 of them are hockey stickers. About what percentage of Kate’s stickers are hockey stickers?  

5. John has 40 marbles in a jar. \( \frac{2}{5} \) of the marbles are red, 12 are green, and 30% are blue. Complete the chart.

<table>
<thead>
<tr>
<th>Number of Marbles</th>
<th>Percentage of Marbles</th>
<th>Fraction of Marbles</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td></td>
<td>( \frac{2}{5} )</td>
</tr>
<tr>
<td>Green</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>Blue</td>
<td>30%</td>
<td></td>
</tr>
</tbody>
</table>

BONUS ► Josh gave some blue marbles to his sister, and then he noticed that 50% of the remaining marbles are red. How many blue marbles did Josh give?
Unit 14: Number Sense

Test (Lessons 58–62, 64–67, 69) — ON

6. Find the unit rate.
   a) 4 pens cost $8  
      1 pen costs ______
   b) 6 apples cost $3  
      1 apple costs ______
   c) 5 litres of gas for 80 km  
      1 litre of gas for ____ km

BONUS ▶ 3 mangoes cost $2.61. How much is 1 mango? ______
1. a) 7
   b) 2 : 7
2. a) It is a ratio table because the ratios in the rows are equivalent.
   b) It is not a ratio table because the ratios in the rows are not equivalent.
3. a) <
   b) <
   c) =
   BONUS >
4. about 30%
5. | 16 | 40% | 2/5 |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>30%</td>
<td>3/10</td>
</tr>
<tr>
<td>12</td>
<td>30%</td>
<td>3/10</td>
</tr>
</tbody>
</table>
   BONUS 8 blue marbles
6. a) $2
   b) $0.50 or 50¢
   c) 16
   BONUS $0.87 or 87¢
1. How many outcomes are there for the event?
   a) spinning the letter B _______
   b) spinning the letter C _______
   c) spinning the letter D _______
   d) spinning a letter in “CANADA” _______
   e) spinning one of the first 10 letters of the alphabet _______

BONUS ► In which part in Question 1 is the event certain? _______ Impossible? _______

2. a) How many times do you expect the spinner to land on the given colour if you spin 40 times?
   i) red _______  ii) blue _______  BONUS ► not blue _______

   b) Simon spins the spinner 40 times. Which chart shows a result he would be most likely to get? ______

   A. Blue
   Red
   Yellow

   B. Blue
   Red
   Yellow

   C. Blue
   Red
   Yellow

   c) Iva spins the spinner 100 times and gets blue 35 times. What is Iva’s experimental probability of spinning blue? Write your answer as a fraction, a decimal, and a percentage.

   ________________________________

   d) Emma and Ray play a game with the spinner. If they spin blue, Emma wins. If they spin yellow, Ray wins. Is the game fair? Explain.
3. You are rolling a regular die with numbers from 1 to 6. Complete the table. Write the probability as a fraction with the lowest numbers.

<table>
<thead>
<tr>
<th>Event</th>
<th>Favourable Outcomes for the Event</th>
<th>Probability of Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Rolling 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>b) Not rolling 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>c) Rolling an even number</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
1. a) 1
   b) 2
   c) 0
   d) 3
   e) 4

BONUS e), c)

2. a) i) 10
   ii) 15

BONUS 25

b) A

c) \[ \frac{35}{100} = \frac{7}{20} \], 0.35, 35%

d) Yes.
Sample explanation:
The probability that
Ray wins is \( \frac{3}{8} \), and
the probability that
Emma wins is also \( \frac{3}{8} \). Since the
probabilities of both
players winning are
the same, the game
is fair.

3. a) 3
   b) 1, 2, 4, 5, 6
   c) 2, 4, 6

BONUS \( \frac{3}{6} \) or \( \frac{1}{2} \)
1. Find the mean and median of the data. Show your work.

   a) 5, 5, 6, 8, 11
   b) 12, 15, 15, 17, 17, 26
   c) 12, 3, 43, 26, 19, 37, 4, 100

2. There are 10 houses that are 5 m tall and 15 houses that are 10 m tall on River Street.

   a) What is the mean height of the houses on River Street?

   b) A developer is proposing to build a 60 m tall house on the corner of River Street. What would the mean height of the houses on the street become?

BONUS ► A city rule prohibits building a house that would add more than 2.1 m height to the mean. Does the proposal break the rule? Explain.
Unit 15: Probability and Data Management

Quiz (Lessons 12, 13) — ON

1. a) Teacher to check work. mean 7, median 6
b) Teacher to check work. mean 17, median 16
c) Sample solution: 3, 4, 12, 19, 26, 37, 43, 100
   mean: \(3 + 4 + 12 + 19 + 26 + 37 + 43 + 100 = 244\)
   \(\frac{244}{8} = 30.5\)
   median: \(\frac{26 + 19}{2} = 22.5\)

2. a) Sample solution:
   10 + 15 = 25 houses,
   10 \times 5 \text{ m} + 15 \times 10 \text{ m}
   = 50 \text{ m} + 150 \text{ m}
   = 200 \text{ m}
   200 \div 25 = 8 \text{ m}
   b) Sample solution:
   25 + 1 = 26 houses
   200 \text{ m} + 60 \text{ m}
   = 260 \text{ m}
   260 \div 26 = 10 \text{ m}

BONUS
No.
Sample explanation:
The proposal adds
2 m to the mean,
which is less than
2.1 m.
1. Would you use primary or secondary data to answer the question?
   a) What is the highest number of words you can type in a minute? _______________________
   
   b) How long does an average hamster live? ______________________

2. Scientists estimate there are 1000 fish in a lake. They catch and release 40 fish. Twelve of them are trout fish. How many trout fish are in the lake?

3. A polling company is conducting a poll about upcoming mayoral elections. They choose 1000 people to survey. Is the sample biased? Explain the cause of any bias.
   a) They select every 50th number in the town’s telephone register and call those numbers.
   
   b) They survey the residents and workers at a nearby retirement home.

4. The table shows the average precipitation (rain and snow) in Victoria, BC, and in Yellowknife, YK, by month. Alex says that Victoria always has more rain and snow than Yellowknife. Is he correct? Explain.

<table>
<thead>
<tr>
<th>City</th>
<th>Jan</th>
<th>Feb</th>
<th>Mar</th>
<th>Apr</th>
<th>May</th>
<th>Jun</th>
<th>Jul</th>
<th>Aug</th>
<th>Sep</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
</tr>
</thead>
<tbody>
<tr>
<td>Victoria, BC</td>
<td>137</td>
<td>108</td>
<td>78</td>
<td>45</td>
<td>36</td>
<td>32</td>
<td>20</td>
<td>24</td>
<td>30</td>
<td>76</td>
<td>147</td>
<td>151</td>
</tr>
<tr>
<td>Yellowknife, YK</td>
<td>14</td>
<td>13</td>
<td>13</td>
<td>11</td>
<td>19</td>
<td>27</td>
<td>35</td>
<td>41</td>
<td>33</td>
<td>35</td>
<td>24</td>
<td>16</td>
</tr>
</tbody>
</table>

**BONUS►** Zara says that the amount of rain and snow in Victoria from November to February is larger than the total amount of rain and snow in Yellowknife in the whole year. Is she correct? Explain.
1. a) primary  
   b) secondary
2. 300
3. a) no  
   b) Yes, there will be more elderly people in the sample than in the whole population.
4. No, Yellowknife has more rain in July, August, and September.

BONUS

Zara is correct.  
Sample explanation: Victoria gets 543 mm of rain and snow during the four months, and Yellowknife gets at most 41 mm of rain and snow every month, so altogether no more than 452 mm of rain and snow in the year.
Unit 15: Probability and Data Management

Test (Lessons 7–17) — ON

1. How many outcomes are there for the event?
   a) spinning red ______
   b) spinning white ______
   c) not spinning red ______
   d) spinning a colour on the flag of Canada ______

   BONUS ►
   e) Write an example of a certain event.
   f) Write an example of an impossible event.

2. a) You are rolling a regular die with numbers from 1 to 6. Complete the table.
   Write the probability as a fraction with the lowest numbers.

<table>
<thead>
<tr>
<th>Event</th>
<th>Favourable Outcomes for the Event</th>
<th>Probability of Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>i) Rolling 5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ii) Rolling a multiple of 3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

   b) If you roll the die 30 times, how many times would you expect the event to happen?
   i) Rolling 5: _____ times            ii) Rolling a multiple of 3: _____ times

   c) Simon rolls the die 15 times and draws a dot above each number he rolled.
   Which chart is he most likely to get? _____

   d) Emma and Ray play a game with a die. If they roll 3 or 4, Emma wins.
   If they roll 1 or 6, Ray wins. Is the game fair? Explain.
3. Both sets show grades out of 20 in the last math test. Set A shows the grades of the math club, set B shows the grades of the whole class.
   
a) Find the mean and median of the data. Show your work.
   
i) Set A: 20, 17, 16, 18, 19
   
ii) Set B: 12, 15, 14, 20, 15, 16, 18, 19, 17, 20
   
   b) Matt thinks that because Set A is part of Set B, he should get the same median and mode. Is he correct? Explain.

4. Scientists estimate there are 1000 fish in a lake. They catch and release 50 fish. Twenty-two of them are bass. How many bass fish are in the lake?

5. A polling company is conducting a poll about upcoming mayoral elections. They choose 1000 people to survey. Is the sample biased? Explain the cause of any bias.
   
a) They ask visitors at the local zoo.
   
b) They survey the volunteers of one of the candidates.
   
c) They select one house or apartment building on each street and give the survey to one person in each household.
Unit 15: Probability and Data Management
Test (Lessons 7–17) — ON

6. Would you use a survey, an observation, or a measurement to answer the question?
   a) What is the longest time I can hold my breath? ________________
   b) What is the most popular movie in our class? ________________
   c) What is the most common hair colour in our class? ________________

7. The graph shows the average precipitation (rain and snow) in Victoria, BC, and in Yellowknife, YK.

   ![Average Precipitation by Month Graph]

   a) Alexa says that Victoria usually has more rain and snow than Yellowknife. Is she correct? Explain and improve her answer.

   b) Describe the trends you see in the graph.

BONUS ► Write one more thing that you can infer from the graph about the climates in Victoria and in Yellowknife. Explain your thinking.
1. a) 1  
b) 2  
c) 3  
d) 3  
**BONUS**  
e) Sample answers: spinning red, white, or green  
f) Sample answer: spinning blue  

2. a)  
   i) 5  
   \[ \frac{1}{6} \]  
   ii) 3, 6  
   \[ \frac{1}{3} \]  
 b)  
   i) 5  
   ii) 10  
 c) B  
 d) Yes, both players have the same probability \( \frac{1}{3} \) of winning.  

3. a)  
   i) Sample solution:  
   mean: \( 16 + 17 + 18 + 19 + 20 \)  
   = 90  
   \[ \frac{90 + 5}{5} = 18 \]  
   median: 18  
   ii) Sample solutions:  
   mean: \( 12 + 14 + 30 + 33 + 37 + 40 = 100 + 66 \)  
   = 166  
   \[ \frac{166 + 10}{10} = 16.6 \]  
   median: \( \frac{16 + 12}{2} = 33 \)  
   + 2 = 16.5  
 b) Matt is not correct.  
   Sample explanation: The members of the math club are likely to have higher grades, so also a higher mean and median.  

4. 440  

5. a) Yes.  
   Sample explanation: People with small children will be overrepresented.  
 b) Yes.  
   Sample explanation: The volunteers will all support their candidate.  
 c) no  

6. a) measurement  
 b) survey  
 c) observation  

7. a) Yes.  
   Sample answer: Victoria has more snow and rain than Yellowknife during all months of the year except July, August, and September.  
 b) Sample answer:  
   The amount of precipitation in Victoria decreases from December to July and rapidly increases from September to November. It slowly grows from July to September and from November to December. The precipitation in Yellowknife slowly grows from April to August and slowly decreases from August to December.  

**BONUS**  
Answers will vary.  
Teacher to check.
Unit 16: Measurement
Quiz (Lessons 17–21) — ON

1. Find the volume of the object made from cubes.
   a)   b)
   Volume = _____________  Volume = _____________

2. Find the volume of the prism.
   a)   b)
   Volume = ________________________  Volume = ________________________
   = ________________________ = ________________________
   BONUS ►
   Volume = ________________________
   = ________________________

3. A rectangular fish tank is 25 cm long and 20 cm wide. The water height is 7.5 cm.
   Emma placed a toy castle in the tank and the water rose to a height of 10 cm.
   What is the volume of the toy castle? Show your work.

4. The volume of the prism is 31.5 cm$^3$. What is the width of the prism?
Unit 16: Measurement

Quiz (Lessons 17–21) — ON

1. a) 9 cm$^3$
   b) 12 mm$^3$

2. a) $(3 \times 2.4 \div 2) \times 5 m$
   $= 3.6 m^2 \times 5 m$
   $= 18 m^3$
   b) $12 cm^2 \times 3 cm$
   $= 36 cm^3$

BONUS

$2.6 m^2 \times 4 m$
$= 10.4 m^3$

3. 1250 cm$^3$

Sample solution: The volume of the water is
$25 cm \times 20 cm \times 7.5 cm$
$= 3750 cm^3$. The volume of the water and the toy castle is $25 cm \times 20 cm \times 10 cm = 5000 cm^3$. So the volume of the toy castle is $5000 cm^3 - 3750 cm^3$
$= 1250 cm^3$

4. 2.1 cm
1. Convert the measurement in litres to millilitres. Then circle the greater measurement.
   a) $700\ \text{mL}$ $7\ \text{L}$  
   b) $6300\ \text{mL}$ $6.35\ \text{L}$

**BONUS** ► One cup contains 240 mL. A recipe for fruit punch calls for 4 cups of apple juice, 1.5 cups of cranberry juice, 1 cup of orange juice, and 1.5 L of ginger ale. How much fruit punch does the recipe make in total?

2. a) Estimate the volume and capacity of the aquarium.
   b) Find the actual volume and capacity of the aquarium.
   c) The aquarium does not have a top. Sketch the net of the aquarium.
   d) How much glass in square centimetres is used to make the aquarium?

**BONUS** ► Jun pours 36 L of water into the aquarium. How high does the water reach? Circle the closest height.

15 cm 20 cm 25 cm 30 cm
1. a) \(7 \text{ L} = 7000 \text{ mL}\)  
   Circle 7 L.  
   b) \(6.35 \text{ L} = 6350 \text{ mL}\)  
   Circle 6.35 L.  
   BONUS 3060 mL
2. a) Answers will vary.  
   Sample estimates:  
   Volume: 36 000 cm\(^3\)  
   Capacity: 36 L  
   b) Volume: 43 920 cm\(^3\)  
   Capacity: 43 920 mL  
   c) Teacher to check.  
   d) 6564 cm\(^2\)  
   BONUS  
   Circle 25 cm.
1. a) Draw the structure on isometric dot paper.

   i) 
   
   ii) 

   b) Each cube above represents 1 cm\(^3\). Find the volume of the structures in part a).

   i) Volume = ____________
   ii) Volume = ____________

2. Shade the given faces. Then draw the view.

   a) front faces
   
   b) front faces
   BONUS ▶ right faces

   front view
   
   front view
   
   right-side view

3. Draw the front, top, and right-side views of the structure.

   top view
   
   front view
   
   right-side view
Unit 16: Measurement

Quiz (Lessons 27, 28) — ON

1. a) i) 
   ![Image]
   ii) 
   ![Image]

   b) i) 6 cm³
   ii) 5 cm³

2. Teacher to check shading.
   a) 
   ![Image]
   b) 
   ![Image]

3. BONUS 
   ![Image]

3. top view 
   ![Image]

   front view 
   ![Image]

   right-side view 
   ![Image]
1. Find the volume of the prism.

a) Volume = ______________________

  = ______________________

b) Volume = ______________________

  = ______________________

2. What is larger, 6000 mL or 6.5 L? How do you know? Explain.

3. a) Estimate the volume and capacity of the aquarium.

b) Find the actual volume and capacity of the aquarium.

BONUS ► Jun pours 27 L of water into the aquarium. Estimate the height of the water without doing the exact calculation. Explain how you did it.
4. A net for a triangular prism is shown on the grid. Each square on the grid is 10 cm long. Find the surface area and volume of the prism.

5. Draw the top, front, and left-side views of the structure.
1. a) $18 \text{ cm} \times 9 \text{ cm} \times 6 \text{ cm} = 972 \text{ cm}^3$

   b) $(4 \text{ m} \times 2.5 \text{ m} - 2) \times 6 \text{ m} = 5 \text{ m}^2 \times 6 \text{ m} = 30 \text{ m}^3$

2. 6.5 L
   Sample explanation:
   $6.5 \text{ L} = 6500 \text{ mL}$.
   $6500 \text{ mL} > 6000 \text{ mL}$,
   so 6.5 L is larger.

3. a) Answers will vary.
   Sample estimates:
   Volume: $30 000 \text{ cm}^3$
   Capacity: 30 L

   b) Volume: $30 030 \text{ cm}^3$
   Capacity: 30 030 mL

   **BONUS**
   Answers will vary.
   Teacher to check.
   Sample answer:
   27 L of water has a volume of 27 000 cm$^3$.
   The area of the bottom face of the aquarium is approximately 1000 cm$^2$.
   So the height of the water is about $27 000 \text{ cm}^3 / 1000 \text{ cm}^2 = 27 \text{ cm}.$

4. Surface area = 4800 cm$^2$
   Volume = 18 000 cm$^3$

5. left-side view
   ![Diagram]
   top view
   ![Diagram]
   front view
   ![Diagram]