Vertex Academy

Year 4 Maths workbook

10 worksheets · answers at the back

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Year 4 · Number: Building Numbers to 10,000

Name: _____ Date: _____

Hi there! This sheet helps you read, write, compare and round whole numbers, and skip-count like a pro. Take your time and show your thinking.

Warm-up

1. Write the number that has 4 thousands, 6 hundreds, 2 tens and 5 ones.

2. In the number 3708, what is the value of the digit 7?

3. Count forwards in 5s from 30, writing the next four numbers.

4. Round 78 to the nearest ten.

Practice

5. Write these numbers in order from smallest to largest: 2450, 2405, 2540, 2045.

6. Round 6473 to the nearest hundred.

7. Round the tenths number 4.7 to the nearest whole number.

8. Count backwards in 25s from 200, writing the next four numbers.

9. At the Avondale market, Mele counts $3672 in the till. She rounds it to the nearest thousand to tell her manager. What number does she say?

10. A packet holds 50 stickers. Sione buys packets and counts in 50s: 50, 100, 150, … How many stickers does he have after 6 packets?

Challenge

11. Use the digits 5, 0, 8 and 3 once each. Make the largest possible 4-digit number and the smallest possible 4-digit number (it cannot start with 0). Then round each to the nearest hundred.

12. Aroha starts at 1985 and counts on in 1000s three times, then counts back in 100s twice. What number does she end on?

Year 4 · Number: Adding, Subtracting, Times & Sharing

Name: _____ Date: _____

Hi there! This sheet gives you practice with adding and subtracting bigger numbers, your times tables, and multiplying and dividing. Take your time and show your working.

Warm-up

1. 1. 6 × 7 = ?

2. 2. 48 ÷ 6 = ?

3. 3. 9 × 1 = ?

4. 4. 7 × 0 = ?

Practice

5. 1. Work out 3462 + 2578 using column addition.

6. 2. Work out 5203 − 1847 using column subtraction.

7. 3. Work out 4 × 68.

8. 4. Work out 156 × 3.

9. 5. Aroha picks 128 feijoas and packs them equally into 4 baskets. How many feijoas go in each basket?

10. 6. The office at Avondale School orders 7 packs of pencils. Each pack has 45 pencils. How many pencils are there altogether?

11. 7. Work out 275 × 6.

12. 8. Work out 435 ÷ 5.

Challenge

13. 1. The netball club buys 6 boxes of balls, with 48 balls in each box. They give 125 balls to a local school. How many balls does the club have left?

14. 2. A factory packs 504 muesli bars equally into boxes of 6. How many boxes are filled? Then, if each box sells for $8, how much money is made?

Year 4 · Number: Getting to Know Tenths

Name: _____ Date: _____

Hi there! This sheet helps you turn tenths into fractions and decimals, put them in order, and add and subtract fractions. Take your time and show your thinking.

Warm-up

1. Write 7 tenths as a decimal.

2. Write 0.4 as a fraction.

3. What is 6 ÷ 10?

4. What is 0.3 × 10?

Practice

5. Put these decimals in order from smallest to largest: 0.8, 0.2, 0.5, 0.1

6. Which is larger, 3/10 or 7/10? Explain how you know.

7. Work out 4/8 + 3/8.

8. Work out 5/6 + 4/6. Write your answer as a mixed number.

9. Mele is baking at the Avondale market. A recipe uses 300 grams of flour. She makes 1/3 of the recipe. How much flour does she need?

10. At kapa haka practice, 1/4 of the group are drinking water. That is 5 tamariki. How many tamariki are in the whole group?

Challenge

11. Tama walked 1.3 km to the dairy and then 0.4 km home to his nana's. How far did he walk altogether? Then, how much further was the first part of his walk than the second?

12. Aroha eats 2/5 of a chocolate block and her brother eats 1/5. How much is left? Write the leftover amount as a fraction, then say whether 2/5 is the same as 4/10.

Year 4 · Number: Money, Coins and Change

Name: _____ Date: _____

Hi! This sheet helps you add up shopping, work out change, and make amounts with different coins and notes. Grab a pencil and let's practise money maths!

Warm-up

1. How many cents are there in one dollar?

2. Add: $3 + $5 + $2

3. What coins could make 70 cents using only 50c, 20c and 10c coins? Give one way.

4. You buy a pen for $4 and pay with a $10 note. How much change do you get?

Practice

5. Aria buys an apple for $2, a muesli bar for $3 and a juice for $4. What is the total cost?

6. A packet of stickers costs $5. How much do 4 packets cost?

7. At the Avondale market, Tane buys 3 mandarins costing $2 each. He pays with a $10 note. How much change does he get?

8. Mele wants to make $5 and 80 cents. Show two different combinations of notes and coins.

9. A comic costs $6 and a bookmark costs $2. Sam buys one of each and pays with a $10 note. How much change does he receive?

10. List three different ways to make $2 using 50c, 20c and $1 coins.

Challenge

11. Ben buys 2 pies at $4 each and 3 drinks at $3 each. He pays with a $20 note. How much change does he get?

12. Hana has three $2 coins, four $1 coins and two 50c coins. Does she have enough to buy a book that costs $11.50? How much money does she have altogether?

Year 4 · Algebra: Balancing Number Sentences and Growing Patterns

Name: _____ Date: _____

Hi there! This sheet helps you practise checking if number sentences are true, filling in the missing numbers, and spotting how patterns grow. Take your time and show your working!

Warm-up

1. True or false? 6 × 4 = 24

2. Fill in the box: 30 + ☐ = 50

3. True or false? 15 − 8 = 6

4. Continue this pattern: 4, 8, 12, 16, ☐

Practice

5. True or false? 9 × 7 = 63

6. Fill in the box: ☐ ÷ 5 = 8

7. Fill in the box to keep the balance: 350 − ☐ = 200

8. Describe this growing pattern and write the next two numbers: 3, 6, 12, 24, ☐, ☐

9. Mele is saving koha for a school trip. She starts with $5 and adds $3 each week. How much has she saved after week 1, week 2, week 3 and week 4?

10. At the Avondale market, apples come in bags of 6. Sione buys 4 bags. Write a multiplication sentence and work out how many apples he has.

Challenge

11. Find the missing number that keeps both sides equal: 7 × 6 = ☐ + 12

12. A pattern starts at 2 and each number is double the one before: 2, 4, 8, 16, … What is the 6th number in the pattern?

Year 4 · Measurement: Measuring All Around Us

Name: _____ Date: _____

Hi there! This sheet gives you practice measuring length, area, angles, temperature and time. Remember to always write the unit (like cm or °C) next to your number!

Warm-up

1. How many minutes are there in 1 hour?

2. A square has sides of 5 cm. What is the area? (area = side × side)

3. A quarter turn is how many degrees?

4. Write this length using both units: 1 metre and 40 centimetres. How many centimetres is that altogether?

Practice

5. A rectangle garden bed is 6 m long and 3 m wide. What is its area?

6. Find the perimeter of a triangle with sides 8 cm, 5 cm and 7 cm.

7. The thermometer outside the classroom in Avondale reads 14°C in the morning and 21°C at lunchtime. How much warmer is it at lunchtime?

8. Word problem: Mere walks to school. She leaves home at 8:15 and arrives at 8:47. How long did her walk take?

9. Word problem: Tama fills a rectangular box with identical cubes. The bottom layer holds 4 rows of 3 cubes, and he stacks 2 layers. How many cubes fit in the box (this is the volume in cubes)?

10. An angle opens a little less than a straight line. Is it closest to 90°, 180° or 360°? Explain.

Challenge

11. An irregular shape drawn on a grid covers 7 full squares and 4 half squares. What is its total area in squares?

12. A netball game is played in 4 quarters. Each quarter lasts 15 minutes. What is the total playing time in minutes, and how many hours and minutes is that?

Year 4 · Geometry: Shapes, Sides and Symmetry

Name: _____ Date: _____

Hi there! This sheet helps you name shapes, count their sides and corners, and find lines of symmetry. Take your time and enjoy spotting the patterns!

Warm-up

1. How many sides does a hexagon have?

2. How many corners (vertices) does a triangle have?

3. What is the name of a shape with 5 sides?

4. True or false: a square has 4 sides that are all the same length.

Practice

5. Name each polygon by its number of sides: (a) 4 sides, (b) 8 sides, (c) 10 sides.

6. A polygon has all its sides equal and all its angles equal. Is it a regular polygon or an irregular polygon?

7. Fill in the table for a regular polygon: how many edges and how many vertices does a regular heptagon (7 sides) have?

8. How many lines of symmetry does a square have? How many does a circle have?

9. Word problem: Aroha is making a garden path using tiles shaped like regular pentagons. Each pentagon tile has 5 equal sides of 12 cm. What is the total length around the edge (perimeter) of one tile?

10. Word problem: At Avondale Primary, Mr Tui draws two shapes on the board. Shape A has 6 equal sides and 6 equal angles. Shape B has 6 sides but they are all different lengths. Which shape is regular and which is irregular? Name Shape A.

Challenge

11. A regular octagon has 8 lines of symmetry. A regular hexagon has 6 lines of symmetry. Look at the pattern: how many lines of symmetry does a regular polygon have compared to its number of sides? Use this to find the lines of symmetry in a regular decagon (10 sides).

12. Leilani has a regular polygon tile with a perimeter of 48 cm. Each side is 6 cm long. How many sides does the tile have, and what is the name of this shape? How many lines of symmetry does it have?

Year 4 · Statistics: Sorting and Counting Data

Name: _____ Date: _____

Hi there! This sheet helps you learn about different kinds of data, words we can sort into groups, and numbers we count or measure. Grab a pencil and have fun!

Warm-up

1. Is the colour of a car (red, blue, white) something we sort into groups, or something we count? Write "sort into groups" or "count".

2. How many pets a family owns is counted. Write down three numbers that could be answers.

3. Kiri did 18 skips in the first try and 21 skips in the second try. How many skips altogether?

4. A ribbon is 47 cm long. Round it to the nearest 10 cm.

Practice

5. Tick which of these are counted (discrete) and which are measured (continuous): (a) number of goals in a netball game, (b) how tall you are, (c) number of students in a class.

6. At Avondale School, the favourite fruit of 5 students was: apple, banana, apple, kiwifruit, apple. Which fruit was most popular, and how many chose it?

7. Tama timed how long it took to run 100 m on three days: 24 seconds, 22 seconds, 25 seconds. What was his fastest time?

8. Mrs Patel's class counted skips in 30 seconds: Sina 34, Leo 29, Mere 41. How many more skips did Mere do than Leo?

9. A water bottle holds 748 mL. Round this to the nearest 100 mL.

10. Four friends measured their long jumps: 1.2 m, 1.5 m, 1.3 m, 1.5 m. What is the difference between the longest and shortest jump?

Challenge

11. The class recorded how many skips each person did in 30 seconds: 20, 25, 25, 30, 30, 30. What number of skips happened most often, and what is the total of all skips?

12. Ana ran 1000 m in 5 minutes and 40 seconds. Rewrite this time in seconds, then say whether it rounds to the nearest minute as 5 or 6 minutes.

Year 4 · Statistics: Picture the Data

Name: _____ Date: _____

Hi there! This sheet is all about turning numbers into dot plots and bar graphs so we can spot patterns. Remember to give every graph a clear title, label your axes, and start your scale at 0!

Warm-up

1. A dot plot shows how many pets some tamariki have. There are 3 dots above the number 2. How many children have exactly 2 pets?

2. On a bar graph, the scale on the side goes 0, 2, 4, 6, 8. What number should the scale always start at?

3. Name the two kinds of graph we use for numerical data in this unit.

4. A bar graph is missing its heading. Which part tells us the purpose of the graph, the title or the axis units?

Practice

5. Mila asked 5 friends how many books they read last week. Their answers were: 1, 3, 2, 1, 3. Draw a dot plot for the numbers 0 to 4 and put the right number of dots above each value.

6. Here are the scooters counted outside four classrooms: Room 1 has 4, Room 2 has 6, Room 3 has 3, Room 4 has 5. On a bar graph with a scale going up in 1s, how tall would the tallest bar be?

7. Using the same scooter data (4, 6, 3, 5), how many scooters were counted altogether?

8. A dot plot titled 'Goals scored by the Avondale team each game' shows: 0 goals (2 dots), 1 goal (3 dots), 2 goals (1 dot), 3 goals (1 dot). How many games were played in total?

9. Word problem: Noa counted the colours of jandals at the beach. He found 5 blue, 2 red, 4 green and 1 yellow. He wants to make a bar graph. What should the height of the 'green' bar be, and which colour bar is the shortest?

10. Word problem: Aria surveyed her class about how many glasses of water they drank. She recorded: 2, 3, 2, 4, 2, 3. If she makes a dot plot, which number of glasses has the most dots, and how many dots is that?

Challenge

11. Kauri made a bar graph of pieces of fruit sold at the school gala: apples 8, bananas 6, oranges 10, pears 4. He wants his scale to go up in 2s starting at 0. List the numbers that would be on his scale, and say how many

gridlines (steps) high the 'oranges' bar reaches.

12. Two dot plots show test scores for Room 5 and Room 6. In Room 5 the dots are spread from 3 to 9. In Room 6 the dots are bunched together from 6 to 8. Write one sentence comparing the variation (spread) in the two rooms.

Year 4 · Statistics: Reading Dot Plots

Name: _____ Date: _____

Hi! This sheet helps you read dot plots and answer questions about them. Look carefully at each plot and think about whether the question is asking for a value or how many (the frequency). Have fun!

Warm-up

1. Room 3 at Avondale School made a dot plot of how many brothers and sisters (siblings) each child has. Each x is one child. 0 siblings: x x 1 sibling: x x x x 2 siblings: x x x 3 siblings: x How many children have exactly 1 sibling?

2. Using the same dot plot, what is the most common number of siblings?

3. How many children are in the plot altogether?

4. What is the largest number of siblings that any child has?

Practice

5. Room 6 surveyed how many pets each student owns and made this dot plot. Each x is one student. 0 pets: x x x 1 pet: x x x x x x 2 pets: x x x x x 3 pets: x x 5 pets: x How many students own exactly 2 pets?

6. What is the most common number of pets for a student in Room 6?

7. The student who owns the most pets, how many pets do they own?

8. How many students altogether were surveyed in Room 6?

9. Word problem: The teacher wants to give every pet in Room 6 one treat. How many treats does she need to buy?

10. Word problem: Mia looks at the dot plot and says, 'The pet numbers spread from the smallest to the biggest.' What is the difference between the most pets and the fewest pets any student owns?

Challenge

11. Each pet in Room 6 needs $3 of food each week. Using the total of 27 pets, how much does the whole class spend on pet food in one week?

12. If we line up all 17 students in order from fewest pets to most pets, which number of pets is in the middle of the line?

Answer key (for parents and tutors)

1. Write the number that has 4 thousands, 6 hundreds, 2 tens and 5 ones.
   4 thousands = 4000, 6 hundreds = 600, 2 tens = 20, 5 ones = 5. Add them: 4000 + 600 + 20 + 5 = 4625.

2. In the number 3708, what is the value of the digit 7?
   The 7 is in the hundreds position, so its value is 7 × 100 = 700.

3. Count forwards in 5s from 30, writing the next four numbers.
   Start at 30 and add 5 each time: 30 → 35 → 40 → 45 → 50. The four numbers are 35, 40, 45, 50.

4. Round 78 to the nearest ten.
   78 is between 70 and 80. The halfway point is 75. Since 78 is past 75, it is closer to 80. Rounded to the nearest ten, 78 = 80.

5. Write these numbers in order from smallest to largest: 2450, 2405, 2540, 2045.
   Compare the thousands (all 2), then hundreds, then tens. 2045 (0 hundreds), 2405 (4 hundreds), 2450 (4 hundreds 5 tens), 2540 (5 hundreds). Order: 2045, 2405, 2450, 2540.

6. Round 6473 to the nearest hundred.
   6473 is between 6400 and 6500. The halfway point is 6450. Since 6473 is past 6450, it rounds up to 6500.

7. Round the tenths number 4.7 to the nearest whole number.
   4.7 is between 4 and 5. The halfway point is 4.5. Since 4.7 is past 4.5, it rounds up to 5.

8. Count backwards in 25s from 200, writing the next four numbers.
   Start at 200 and subtract 25 each time: 200 → 175 → 150 → 125 → 100. The four numbers are 175, 150, 125, 100.

9. At the Avondale market, Mele counts $3672 in the till. She rounds it to the nearest thousand to tell her manager. What number does she say?
   3672 is between 3000 and 4000. The halfway point is 3500. Since 3672 is past 3500, it rounds up to 4000. Mele says about $4000.

10. A packet holds 50 stickers. Sione buys packets and counts in 50s: 50, 100, 150, … How many stickers does he have after 6 packets?
    Count in 50s six times: 50, 100, 150, 200, 250, 300. After 6 packets Sione has 300 stickers.

11. Use the digits 5, 0, 8 and 3 once each. Make the largest possible 4-digit number and the smallest possible 4-digit number (it cannot start with 0). Then round each to the nearest hundred.
    Largest: put biggest digits first → 8530. Smallest: 0 cannot go first, so start with 3, then smallest remaining → 3058. Rounding 8530 to the nearest hundred: it is between 8500 and 8600, halfway is 8550, and 8530 is below 8550, so it rounds to 8500. Rounding 3058 to the nearest hundred: it is between 3000 and 3100, halfway is 3050, and 3058 is past 3050, so it rounds to 3100.

12. Aroha starts at 1985 and counts on in 1000s three times, then counts back in 100s twice. What number does she end on?
    Count on in 1000s three times: 1985 → 2985 → 3985 → 4985. Then count back in 100s twice: 4985 → 4885 → 4785. Aroha ends on 4785.

Answer key (for parents and tutors)

1. 1. 6 × 7 = ?
   6 × 7 = 42. (Think 6 groups of 7, or 5 × 7 = 35, then add one more 7: 35 + 7 = 42.)
2. 2. 48 ÷ 6 = ?
   48 ÷ 6 = 8. (Ask: how many 6s make 48? 6 × 8 = 48, so the answer is 8.)
3. 3. 9 × 1 = ?
   9 × 1 = 9. (Multiplying any number by 1 leaves it unchanged, one group of 9 is just 9.)
4. 4. 7 × 0 = ?
   7 × 0 = 0. (Zero groups of 7 means nothing at all, so the answer is 0.)
5. 1. Work out 3462 + 2578 using column addition.
   Line up the columns. Units: 2 + 8 = 10, write 0 carry 1. Tens: 6 + 7 + 1 = 14, write 4 carry 1. Hundreds: 4 + 5 + 1 = 10, write 0 carry 1. Thousands: 3 + 2 + 1 = 6. Answer: 6040.
6. 2. Work out 5203 – 1847 using column subtraction.
   Units: 3 – 7 won't go, borrow. Tens is 0 so borrow across: units become 13 – 7 = 6. Tens: after regrouping it is 9 – 4 = 5. Hundreds: 1 – 8 won't go, borrow from thousands: 11 – 8 = 3. Thousands: 4 – 1 = 3. Answer: 3356. (Check: 1847 + 3356 = 5203.)
7. 3. Work out 4 × 68.
   Partition 68 into 60 + 8. 4 × 60 = 240. 4 × 8 = 32. 240 + 32 = 272. Answer: 272.
8. 4. Work out 156 × 3.
   Partition 156 into 100 + 50 + 6. 3 × 100 = 300. 3 × 50 = 150. 3 × 6 = 18. 300 + 150 + 18 = 468. Answer: 468.
9. 5. Aroha picks 128 feijoas and packs them equally into 4 baskets. How many feijoas go in each basket?
   This is 128 ÷ 4. Split 128 into 120 + 8. 120 ÷ 4 = 30. 8 ÷ 4 = 2. 30 + 2 = 32. Each basket holds 32 feijoas.
10. 6. The office at Avondale School orders 7 packs of pencils. Each pack has 45 pencils. How many pencils are there altogether?
    This is 7 × 45. Partition 45 into 40 + 5. 7 × 40 = 280. 7 × 5 = 35. 280 + 35 = 315. There are 315 pencils altogether.
11. 7. Work out 275 × 6.
    Partition 275 into 200 + 70 + 5. 6 × 200 = 1200. 6 × 70 = 420. 6 × 5 = 30. 1200 + 420 + 30 = 1650. Answer: 1650.
12. 8. Work out 435 ÷ 5.
    Split 435 into 400 + 35. 400 ÷ 5 = 80. 35 ÷ 5 = 7. 80 + 7 = 87. Answer: 87. (Check: 5 × 87 = 435.)
13. 1. The netball club buys 6 boxes of balls, with 48 balls in each box. They give 125 balls to a local school. How many balls does the club have left?
    First find the total: 6 × 48. 6 × 40 = 240 and 6 × 8 = 48, so 240 + 48 = 288 balls. Then subtract the balls given away: 288 – 125. 288 – 125 = 163. The club has 163 balls left.
14. 2. A factory packs 504 muesli bars equally into boxes of 6. How many boxes are filled? Then, if each box sells for $8, how much money is made?
    First divide: 504 ÷ 6. Split 504 into 480 + 24. 480 ÷ 6 = 80 and 24 ÷ 6 = 4, so 80 + 4 = 84 boxes. Then find the money: 84 × 8. 80 × 8 = 640 and 4 × 8 = 32, so 640 + 32 = 672. There are 84 boxes and $672 is made.

Answer key (for parents and tutors)

1. Write 7 tenths as a decimal.
   7 tenths means 7/10. The first column after the decimal point is the tenths column, so we write 0.7. Answer: 0.7
2. Write 0.4 as a fraction.
   0.4 has 4 in the tenths column, so it means 4 tenths. As a fraction that is 4/10. Answer: 4/10
3. What is 6 ÷ 10?
   Dividing by 10 makes each digit move one column smaller, so the 6 (ones) becomes 6 tenths. 6 ÷ 10 = 0.6. Answer: 0.6
4. What is 0.3 × 10?
   Multiplying by 10 makes each digit move one column bigger, so 3 tenths becomes 3 ones. 0.3 × 10 = 3. Answer: 3
5. Put these decimals in order from smallest to largest: 0.8, 0.2, 0.5, 0.1
   Compare the tenths: 1 tenth, 2 tenths, 5 tenths, 8 tenths. In order from smallest to largest: 0.1, 0.2, 0.5, 0.8
6. Which is larger, 3/10 or 7/10? Explain how you know.
   Both fractions have the same denominator (tenths), so we just compare the numerators (top numbers). 7 is more than 3, so 7/10 is larger. Answer: 7/10
7. Work out 4/8 + 3/8.
   The denominators are the same, so we add the numerators: 4 + 3 = 7. The answer is 7/8. Answer: 7/8
8. Work out 5/6 + 4/6. Write your answer as a mixed number.
   Add the numerators: 5 + 4 = 9, giving 9/6 (an improper fraction). Since 6/6 = 1, we have 9/6 = 1 whole and 3/6 left over. Answer: 1 3/6
9. Mele is baking at the Avondale market. A recipe uses 300 grams of flour. She makes 1/3 of the recipe. How much flour does she need?
   Finding 1/3 of 300 means dividing by 3: 300 ÷ 3 = 100. Answer: 100 grams of flour
10. At kapa haka practice, 1/4 of the group are drinking water. That is 5 tamariki. How many tamariki are in the whole group?
    If 1/4 of the group is 5, then the whole group is 4 lots of 5: 5 × 4 = 20. Answer: 20 tamariki
11. Tama walked 1.3 km to the dairy and then 0.4 km home to his nana's. How far did he walk altogether? Then, how much further was the first part of his walk than the second?
    Add the distances: 1.3 + 0.4 = 1.7 km altogether. To find how much further the first part was, subtract: 1.3 − 0.4 = 0.9 km. Answers: 1.7 km altogether, and the first part was 0.9 km further.
12. Aroha eats 2/5 of a chocolate block and her brother eats 1/5. How much is left? Write the leftover amount as a fraction, then say whether 2/5 is the same as 4/10.
    Together they ate 2/5 + 1/5 = 3/5. The whole block is 5/5, so what is left is 5/5 − 3/5 = 2/5 left. For the second part: 2/5 means 2 out of 5 equal parts. If we split each part in half we get 4 out of 10 parts, so 2/5 = 4/10, yes, they are equivalent.

Answer key (for parents and tutors)

1. How many cents are there in one dollar?
   There are 100 cents in one dollar. New Zealand money is decimal, so $1 = 100c.
2. Add: $3 + $5 + $2
   $3 + $5 = $8, then $8 + $2 = $10. The total is $10.
3. What coins could make 70 cents using only 50c, 20c and 10c coins? Give one way.
   One way: 50c + 20c = 70c. Another way: 50c + 10c + 10c = 70c. Any correct combination totalling 70c is fine.
4. You buy a pen for $4 and pay with a $10 note. How much change do you get?
   $10 – $4 = $6. You get $6 change.
5. Aria buys an apple for $2, a muesli bar for $3 and a juice for $4. What is the total cost?
   $2 + $3 = $5, then $5 + $4 = $9. The total is $9.
6. A packet of stickers costs $5. How much do 4 packets cost?
   4 × $5 = $20. Four packets cost $20.
7. At the Avondale market, Tane buys 3 mandarins costing $2 each. He pays with a $10 note. How much change does he get?
   3 × $2 = $6 for the mandarins. Change = $10 – $6 = $4. Tane gets $4 change.
8. Mele wants to make $5 and 80 cents. Show two different combinations of notes and coins.
   Way 1: one $5 note + 50c + 20c + 10c = $5.80. Way 2: five $1 coins + two 20c + two 20c… let's use $5 note + 80c made as 50c + 10c + 10c + 10c. Any combination totalling $5.80 is correct, for example $2 + $2 + $1 + 50c + 20c + 10c.
9. A comic costs $6 and a bookmark costs $2. Sam buys one of each and pays with a $10 note. How much change does he receive?
   $6 + $2 = $8 total. Change = $10 – $8 = $2. Sam receives $2 change.
10. List three different ways to make $2 using 50c, 20c and $1 coins.
    Way 1: two $1 coins = $2. Way 2: $1 + 50c + 50c = $2. Way 3: $1 + 50c + 20c + 20c + 10c = $2 (using a 10c too). Any correct combination totalling $2 is accepted; for example four 50c coins = $2.
11. Ben buys 2 pies at $4 each and 3 drinks at $3 each. He pays with a $20 note. How much change does he get?
    Pies: 2 × $4 = $8. Drinks: 3 × $3 = $9. Total = $8 + $9 = $17. Change = $20 – $17 = $3. Ben gets $3 change.
12. Hana has three $2 coins, four $1 coins and two 50c coins. Does she have enough to buy a book that costs $11.50? How much money does she have altogether?
    Three $2 = $6. Four $1 = $4. Two 50c = $1. Total = $6 + $4 + $1 = $11. She has $11, which is less than $11.50, so she does NOT have enough. She is 50c short.

Answer key (for parents and tutors)

1. True or false? 6 × 4 = 24
   True. 6 × 4 = 24, so the number sentence is correct.
2. Fill in the box: 30 + ☐ = 50
   ☐ = 20. We need 30 plus something to make 50. 50 − 30 = 20, so ☐ = 20.
3. True or false? 15 − 8 = 6
   False. 15 − 8 = 7, not 6, so the number sentence is false.
4. Continue this pattern: 4, 8, 12, 16, ☐
   ☐ = 20. The pattern grows by adding 4 each time: 16 + 4 = 20.
5. True or false? 9 × 7 = 63
   True. 9 × 7 = 63, so the number sentence is correct.
6. Fill in the box: ☐ ÷ 5 = 8
   ☐ = 40. If a number divided by 5 gives 8, then the number is 8 × 5 = 40. Check: 40 ÷ 5 = 8. ✓
7. Fill in the box to keep the balance: 350 − ☐ = 200
   ☐ = 150. To go from 350 down to 200 we subtract 150. Check: 350 − 150 = 200. ✓
8. Describe this growing pattern and write the next two numbers: 3, 6, 12, 24, ☐, ☐
   The pattern doubles each time (multiply by 2). 24 × 2 = 48, and 48 × 2 = 96. The next two numbers are 48 and 96.
9. Mele is saving koha for a school trip. She starts with $5 and adds $3 each week. How much has she saved after week 1, week 2, week 3 and week 4?
   Week 1: $5. Week 2: $5 + $3 = $8. Week 3: $8 + $3 = $11. Week 4: $11 + $3 = $14. After four weeks Mele has saved $14.
10. At the Avondale market, apples come in bags of 6. Sione buys 4 bags. Write a multiplication sentence and work out how many apples he has.
    The number sentence is 6 × 4 = ☐. 6 × 4 = 24, so Sione has 24 apples.
11. Find the missing number that keeps both sides equal: 7 × 6 = ☐ + 12
    First work out the left side: 7 × 6 = 42. So we need ☐ + 12 = 42. To find ☐, subtract 12 from 42: 42 − 12 = 30. So ☐ = 30. Check: 30 + 12 = 42, and 7 × 6 = 42, so both sides balance. ✓
12. A pattern starts at 2 and each number is double the one before: 2, 4, 8, 16, ... What is the 6th number in the pattern?
    Each term doubles (× 2). 1st: 2, 2nd: 4, 3rd: 8, 4th: 16, 5th: 16 × 2 = 32, 6th: 32 × 2 = 64. The 6th number is 64.

Answer key (for parents and tutors)

1. How many minutes are there in 1 hour?
   There are 60 minutes in 1 hour.
2. A square has sides of 5 cm. What is the area? (area = side × side)
   Area = 5 cm × 5 cm = 25 square centimetres (25 cm²).
3. A quarter turn is how many degrees?
   A quarter turn is 90 degrees (90°).
4. Write this length using both units: 1 metre and 40 centimetres. How many centimetres is that altogether?
   1 m and 40 cm. Since 1 m = 100 cm, that is 100 cm + 40 cm = 140 cm altogether.
5. A rectangle garden bed is 6 m long and 3 m wide. What is its area?
   Area = length × width = 6 m × 3 m = 18 square metres (18 m²).
6. Find the perimeter of a triangle with sides 8 cm, 5 cm and 7 cm.
   Perimeter is the distance all the way around: 8 cm + 5 cm + 7 cm = 20 cm.
7. The thermometer outside the classroom in Avondale reads 14°C in the morning and 21°C at lunchtime. How much warmer is it at lunchtime?
   21°C − 14°C = 7°C. It is 7°C warmer at lunchtime.
8. Word problem: Mere walks to school. She leaves home at 8:15 and arrives at 8:47. How long did her walk take?
   From 8:15 to 8:47 is 47 − 15 = 32 minutes. Her walk took 32 minutes.
9. Word problem: Tama fills a rectangular box with identical cubes. The bottom layer holds 4 rows of 3 cubes, and he stacks 2 layers. How many cubes fit in the box (this is the volume in cubes)?
   One layer = 4 × 3 = 12 cubes. With 2 layers: 12 × 2 = 24 cubes. The volume is 24 cubes.
10. An angle opens a little less than a straight line. Is it closest to 90°, 180° or 360°? Explain.
    A straight line is 180°, so an angle a little less than straight is closest to 180°. (A full turn is 360° and a right angle is 90°.)
11. An irregular shape drawn on a grid covers 7 full squares and 4 half squares. What is its total area in squares?
    Full squares = 7. Half squares: 4 halves = 4 × ½ = 2 whole squares. Total area = 7 + 2 = 9 squares.
12. A netball game is played in 4 quarters. Each quarter lasts 15 minutes. What is the total playing time in minutes, and how many hours and minutes is that?
    Total = 4 × 15 = 60 minutes. Since 60 minutes = 1 hour, that is 1 hour and 0 minutes (1 hour of play).

Answer key (for parents and tutors)

1. How many sides does a hexagon have?
   A hexagon has 6 sides.
2. How many corners (vertices) does a triangle have?
   A triangle has 3 vertices (corners).
3. What is the name of a shape with 5 sides?
   A shape with 5 sides is called a pentagon.
4. True or false: a square has 4 sides that are all the same length.
   True. A square has 4 equal sides, so it is a regular polygon.
5. Name each polygon by its number of sides: (a) 4 sides, (b) 8 sides, (c) 10 sides.
   (a) 4 sides is a quadrilateral. (b) 8 sides is an octagon. (c) 10 sides is a decagon.
6. A polygon has all its sides equal and all its angles equal. Is it a regular polygon or an irregular polygon?
   It is a regular polygon. Regular polygons have all sides the same length AND all interior angles equal. If either was different, it would be irregular.
7. Fill in the table for a regular polygon: how many edges and how many vertices does a regular heptagon (7 sides) have?
   A heptagon has 7 edges and 7 vertices. A polygon always has the same number of edges as vertices.
8. How many lines of symmetry does a square have? How many does a circle have?
   A square has 4 lines of symmetry (two through the middle of opposite sides, and two along the diagonals). A circle has an infinite number of lines of symmetry, because you can draw a line through its centre in any direction.
9. Word problem: Aroha is making a garden path using tiles shaped like regular pentagons. Each pentagon tile has 5 equal sides of 12 cm. What is the total length around the edge (perimeter) of one tile?
   A regular pentagon has 5 equal sides, each 12 cm. Perimeter = 5 × 12 cm = 60 cm. So one tile measures 60 cm all the way around.
10. Word problem: At Avondale Primary, Mr Tui draws two shapes on the board. Shape A has 6 equal sides and 6 equal angles. Shape B has 6 sides but they are all different lengths. Which shape is regular and which is irregular? Name Shape A.
    Shape A is regular because all 6 sides and all 6 angles are equal, it is a regular hexagon. Shape B is irregular because its sides are different lengths, so it is an irregular hexagon.
11. A regular octagon has 8 lines of symmetry. A regular hexagon has 6 lines of symmetry. Look at the pattern: how many lines of symmetry does a regular polygon have compared to its number of sides? Use this to find the lines of symmetry in a regular decagon (10 sides).
    For a regular polygon, the number of lines of symmetry equals the number of sides. An octagon (8 sides) has 8, a hexagon (6 sides) has 6. So a regular decagon (10 sides) has 10 lines of symmetry.
12. Leilani has a regular polygon tile with a perimeter of 48 cm. Each side is 6 cm long. How many sides does the tile have, and what is the name of this shape? How many lines of symmetry does it have?
    Number of sides = perimeter ÷ side length = 48 cm ÷ 6 cm = 8 sides. A shape with 8 equal sides is a regular octagon. Because it is a regular polygon, it has 8 lines of symmetry (one for each side).

Answer key (for parents and tutors)

1. Is the colour of a car (red, blue, white) something we sort into groups, or something we count? Write "sort into groups" or "count".
   Sort into groups. Car colour is a categorical variable, it names a group rather than giving a number.

2. How many pets a family owns is counted. Write down three numbers that could be answers.
   Any whole numbers work, for example 0, 2 and 4. The number of pets is a discrete numerical variable because we count it in whole numbers.

3. Kiri did 18 skips in the first try and 21 skips in the second try. How many skips altogether?
   18 + 21 = 39 skips altogether.

4. A ribbon is 47 cm long. Round it to the nearest 10 cm.
   47 is closer to 50 than to 40, so 47 cm rounds to 50 cm.

5. Tick which of these are counted (discrete) and which are measured (continuous): (a) number of goals in a netball game, (b) how tall you are, (c) number of students in a class.
   (a) counted, goals are whole numbers. (b) measured, height is measured with a ruler or tape. (c) counted, students are whole numbers.

6. At Avondale School, the favourite fruit of 5 students was: apple, banana, apple, kiwifruit, apple. Which fruit was most popular, and how many chose it?
   Apple was chosen 3 times, banana 1 time, kiwifruit 1 time. Apple was most popular with 3 students.

7. Tama timed how long it took to run 100 m on three days: 24 seconds, 22 seconds, 25 seconds. What was his fastest time?
   Compare 24, 22 and 25. The smallest number is fastest, so 22 seconds was his fastest time.

8. Mrs Patel's class counted skips in 30 seconds: Sina 34, Leo 29, Mere 41. How many more skips did Mere do than Leo?
   41 − 29 = 12. Mere did 12 more skips than Leo.

9. A water bottle holds 748 mL. Round this to the nearest 100 mL.
   748 is between 700 and 800. It is closer to 700 (748 − 700 = 48, and 800 − 748 = 52), so it rounds to 700 mL.

10. Four friends measured their long jumps: 1.2 m, 1.5 m, 1.3 m, 1.5 m. What is the difference between the longest and shortest jump?
    Longest jump = 1.5 m, shortest jump = 1.2 m. Difference = 1.5 − 1.2 = 0.3 m (30 cm).

11. The class recorded how many skips each person did in 30 seconds: 20, 25, 25, 30, 30, 30. What number of skips happened most often, and what is the total of all skips?
    The most common value (the mode) is 30, because it appears three times. Total = 20 + 25 + 25 + 30 + 30 + 30 = 160 skips.

12. Ana ran 1000 m in 5 minutes and 40 seconds. Rewrite this time in seconds, then say whether it rounds to the nearest minute as 5 or 6 minutes.
    5 minutes = 5 × 60 = 300 seconds. Add 40 seconds: 300 + 40 = 340 seconds. Since 40 seconds is more than 30 seconds (half a minute), the time rounds up to 6 minutes.

Answer key (for parents and tutors)

1. A dot plot shows how many pets some tamariki have. There are 3 dots above the number 2. How many children have exactly 2 pets?
   Each dot stands for one child. 3 dots above the number 2 means 3 children have exactly 2 pets.
2. On a bar graph, the scale on the side goes 0, 2, 4, 6, 8. What number should the scale always start at?
   The scale should always start at 0. Starting at 0 keeps the bars fair to compare.
3. Name the two kinds of graph we use for numerical data in this unit.
   Dot plots and bar graphs.
4. A bar graph is missing its heading. Which part tells us the purpose of the graph, the title or the axis units?
   The title. It tells us the purpose, for example 'Favourite fruit of Room 6'.
5. Mila asked 5 friends how many books they read last week. Their answers were: 1, 3, 2, 1, 3. Draw a dot plot for the numbers 0 to 4 and put the right number of dots above each value.
   Draw a number line labelled 0, 1, 2, 3, 4 with the title 'Books read last week'. Above 0 put 0 dots, above 1 put 2 dots (two friends said 1), above 2 put 1 dot, above 3 put 2 dots, above 4 put 0 dots. Total dots = 5, matching 5 friends.
6. Here are the scooters counted outside four classrooms: Room 1 has 4, Room 2 has 6, Room 3 has 3, Room 4 has 5. On a bar graph with a scale going up in 1s, how tall would the tallest bar be?
   The tallest count is Room 2 with 6 scooters, so the tallest bar reaches 6 on the scale.
7. Using the same scooter data (4, 6, 3, 5), how many scooters were counted altogether?
   4 + 6 + 3 + 5 = 18 scooters altogether.
8. A dot plot titled 'Goals scored by the Avondale team each game' shows: 0 goals (2 dots), 1 goal (3 dots), 2 goals (1 dot), 3 goals (1 dot). How many games were played in total?
   Add all the dots: 2 + 3 + 1 + 1 = 7 games in total.
9. Word problem: Noa counted the colours of jandals at the beach. He found 5 blue, 2 red, 4 green and 1 yellow. He wants to make a bar graph. What should the height of the 'green' bar be, and which colour bar is the shortest?
   The green bar should reach 4. The shortest bar is yellow, with a height of 1 (only 1 yellow pair).
10. Word problem: Aria surveyed her class about how many glasses of water they drank. She recorded: 2, 3, 2, 4, 2, 3. If she makes a dot plot, which number of glasses has the most dots, and how many dots is that?
    Count each value: 2 appears 3 times, 3 appears 2 times, 4 appears 1 time. The value 2 has the most dots, with 3 dots.
11. Kauri made a bar graph of pieces of fruit sold at the school gala: apples 8, bananas 6, oranges 10, pears 4. He wants his scale to go up in 2s starting at 0. List the numbers that would be on his scale, and say how many gridlines (steps) high the 'oranges' bar reaches.
    The scale in 2s starting at 0, going high enough for 10, is: 0, 2, 4, 6, 8, 10. The oranges bar reaches 10, which is 5 steps up the scale (0→2→4→6→8→10).
12. Two dot plots show test scores for Room 5 and Room 6. In Room 5 the dots are spread from 3 to 9. In Room 6 the dots are bunched together from 6 to 8. Write one sentence comparing the variation (spread) in the two rooms.
    Room 5 has more variation because its scores spread across a wider range (3 to 9, a range of 6), while Room 6's scores are bunched together in a smaller range (6 to 8, a range of 2). This means Room 6's results are more similar to each other.

Answer key (for parents and tutors)

1. Room 3 at Avondale School made a dot plot of how many brothers and sisters (siblings) each child has. Each x is one child. 0 siblings: x x 1 sibling: x x x x 2 siblings: x x x 3 siblings: x How many children have exactly 1 sibling?
   Count the x marks above '1 sibling'. There are 4 marks, so 4 children have exactly 1 sibling.

2. Using the same dot plot, what is the most common number of siblings?
   Find the tallest stack of x marks. '1 sibling' has the most marks (4), which is more than any other. So the most common number of siblings is 1.

3. How many children are in the plot altogether?
   Add all the x marks: 2 + 4 + 3 + 1 = 10 children altogether.

4. What is the largest number of siblings that any child has?
   Look for the value furthest to the right that still has an x. That is 3, so the largest number of siblings any child has is 3.

5. Room 6 surveyed how many pets each student owns and made this dot plot. Each x is one student. 0 pets: x x x 1 pet: x x x x x x 2 pets: x x x x x 3 pets: x x 5 pets: x How many students own exactly 2 pets?
   Count the x marks above '2 pets'. There are 5 marks, so 5 students own exactly 2 pets.

6. What is the most common number of pets for a student in Room 6?
   Find the tallest stack. '1 pet' has 6 marks, more than any other stack. So the most common number of pets is 1.

7. The student who owns the most pets, how many pets do they own?
   The value furthest to the right with an x is 5. So the student with the most pets owns 5 pets. (Note: this asks for the value, not the frequency.)

8. How many students altogether were surveyed in Room 6?
   Add up all the x marks: 3 + 6 + 5 + 2 + 1 = 17 students altogether.

9. Word problem: The teacher wants to give every pet in Room 6 one treat. How many treats does she need to buy?
   Multiply each pet number by how many students, then add: 0 × 3 = 0 1 × 6 = 6 2 × 5 = 10 3 × 2 = 6 5 × 1 = 5 Total pets = 0 + 6 + 10 + 6 + 5 = 27 pets. She needs 27 treats.

10. Word problem: Mia looks at the dot plot and says, 'The pet numbers spread from the smallest to the biggest.' What is the difference between the most pets and the fewest pets any student owns?
    The smallest value with an x is 0 pets and the largest is 5 pets. The difference (spread) is 5 − 0 = 5 pets.

11. Each pet in Room 6 needs $3 of food each week. Using the total of 27 pets, how much does the whole class spend on pet food in one week?
    There are 27 pets and each costs $3. Work out 27 × 3. Break it up: 20 × 3 = 60 and 7 × 3 = 21, so 60 + 21 = 81. The class spends $81 each week.

12. If we line up all 17 students in order from fewest pets to most pets, which number of pets is in the middle of the line?
    With 17 students, the middle is the 9th student. Count along the ordered list: students 1–3 own 0 pets, students 4–9 own 1 pet, students 10–14 own 2 pets, students 15–16 own 3 pets, student 17 owns 5 pets. The 9th student is in the '1 pet' group, so the middle of the data is 1 pet.