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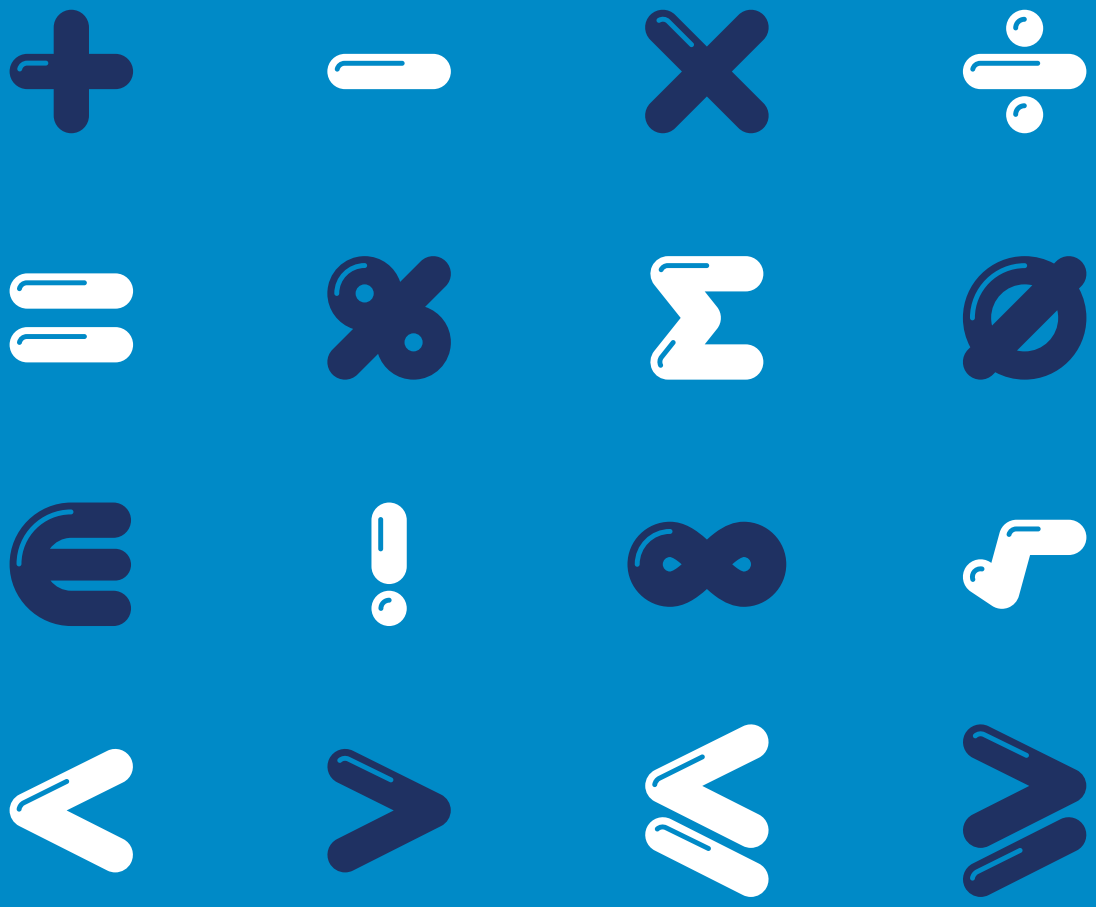
LEARNING AND LEADERSHIP DIRECTORATE – PRIMARY EDUCATION



MATHEMATICS STAGE 3

DIAGNOSTIC TASKS

About this resource

WHY?

These diagnostic tasks have been designed to assist primary teachers in accurately identifying the skills, knowledge and understandings of students in Stage 3. They are intended to be a diagnostic snapshot of the learning of Stage 3 key ideas and concepts from the NSW Mathematics K-10 syllabus for the Australian Curriculum.

Secondary teachers may also use these diagnostic tasks as part of their assessment practices. This may assist teachers in determining the level of student prior understanding of the syllabus concepts and identifying areas for development. This assessment information is useful to assist in the smooth curriculum transition nwithin middle years of mathematics.

USING THIS RESOURCE

This resource includes a range of diagnostic tasks to assess content knowledge and skills in mathematics. There are tasks for each of the substrands, excluding Position.

There is a diagnostic for most key ideas. However, some have been excluded due to the practical or hands-on nature of the task required. These should be assessed in a different format.

These tasks are NOT intended to be given as a complete test, but rather individual substrands or particular questions might be given to gather information about a student or group of students around a specific concept or key idea to guide future teaching and learning.

A section could be used as a pre-assessment for Stage 3 students to identify where students are at with their conceptual understanding and be used by the teacher to differentiate content to meet the needs of the students.

Each question focusses on a particular concept of learning within the substrand and is linked to a key idea. Working mathematically components are included in certain questions where students need to explain their reasoning and communicate their thinking and strategies. This will assist the teacher in identifying student strategies and processes used to apply their knowledge and skills of mathematical concepts.

It should be noted that this resource is one example of assessment for learning. Other forms of assessment such as hands-on tasks, practical activities, observations and anecdotal evidence should also be used by teachers to identify student learning needs.

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Introduction

Mathematics Stage 3 Diagnostic Tasks have been designed to assist primary teachers in accurately identifying skills, knowledge and understandings of students in Stage 3. The tasks are intended to be a diagnostic snapshot of learning key ideas and concepts from the NSW Mathematics K-10 Syllabus for the Australian curriculum. This resource is one example of assessment for learning, other forms of assessment include hands-on tasks, practical activities, investigations, observations and anecdotal evidence. A wide range of assessments are also used by teachers to identify teaching points and learning needs for all students.

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Stage 3: Whole Numbers

Name: _____ Class: _____ Date: _____

STAGE 3: WHOLE NUMBERS

QUESTION 1: PLACE VALUE

KEY IDEAS

a) Arrange the following numbers in ascending order: 600, 366, 60, 45, 606, 10 660

_____ _____ _____ _____ _____ _____

Read, write and order numbers of any size

b) Write the following numbers in descending order: 435, 708, 3480, 56, 16, 348

_____ _____ _____ _____ _____ _____

c) What is the value of the 8 in the following numbers.

8067 _____ 1089 _____ 807 305 _____

State the place value of digits in numbers of any size

d) Write each number in expanded notation.

825 = _____ + _____ + _____

64 350 = _____ + _____ + _____ + _____ + _____

Record numbers of any size using expanded notation

e) 160 can be written as 100 + 60. Write two other ways 160 could be split.

_____ _____

QUESTION 2: ROUNDING

KEY IDEAS

a) Round 43 520 to the nearest thousand. _____

b) Round 1 689 200 to the nearest million. _____

Read, write and order numbers of any size

QUESTION 3: READING AND WRITING NUMBERS

KEY IDEAS

a) Write the number six thousand and fifty two. _____

b) Write the number one million, two hundred thousand, three hundred and five.

_____

c) Write 74 987 in words. _____

Read, write and order numbers of any size

QUESTION 4: FACTORS

KEY IDEAS

a) List all the factors of 64 _____

b) List the highest common factor of 15 and 35 _____

c) List the highest common factor of 81 and 54 _____

Determine factors and multiples of whole numbers

QUESTION 5: MULTIPLES

KEY IDEAS

a) List all the multiples of 8 under 100 _____

b) List the lowest common multiple of 48 and 24 _____

Determine factors and multiples of whole numbers

Name: _____ Class: _____

STAGE 3: WHOLE NUMBERS

QUESTION 6: INTEGERS

KEY IDEAS

Recognise the location of negative numbers in relation to zero on a number line

a) What is an integer? _____

b) Place the following numbers on the number line below: 5, -4, 3, 0, 1, -3, -2, -1, 4, -5, 2

c) Write if the following statements are true or false.

-4 > 0 _____ 3 < -6 _____ 8 > - 2 _____

QUESTION 7: PRIME AND COMPOSITE NUMBERS

KEY IDEAS

Identify and describe prime and composite numbers

a) What is a prime number? _____

_____

b) List all the prime numbers from 1 to 20 _____

c) Explain why 22 is not a prime number. _____

_____

d) Determine whether 11 is a prime or composite number and explain why.

_____

_____

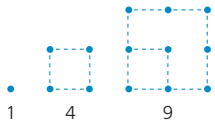
QUESTION 8: SQUARE AND TRIANGULAR NUMBERS

KEY IDEAS

Model and describe square numbers

a) Look at the pattern of square numbers below. Describe what happens in the pattern and find the next three terms.

Square numbers



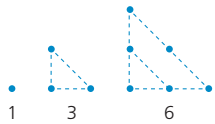
_____

_____

_____

b) Look at the pattern of triangular numbers below. Describe what happens in the pattern and find the next three terms.

Triangular numbers



_____

_____

_____

Stage 3: Addition & Subtraction

Name: _____ Class: _____ Date: _____

STAGE 3: ADDITION & SUBTRACTION

QUESTION 1: ADDITION

KEY IDEAS

For the following questions show your working and explain your chosen strategy.

a) Find the sum of 6587 and 329

b) Find the total of these three numbers. 589, 4026 and 3904

c) If a computer costs $1599 and its price was increased by $350, how much is the new price?

d) Katie had $2650 in her bank account. After a deposit, her account increased by $475. How much is in Katie's account now?

e) Billy pays $350 000 for a unit, he also needs to pay $30 000 in taxes and $4500 in fees. How much does Billy pay altogether for the unit?

f) Sara buys a car for $22 590. She also pays $1000 for car insurance and $500 to register the car. How much does Sara pay altogether?

Select and apply efficient mental and written strategies for addition of numbers of any size

Solve word problems and record the strategy used, including problems involving money

Select and apply efficient mental and written strategies to solve word problems and record the strategy used

Name: _____ Class: _____

STAGE 3: ADDITION & SUBTRACTION

QUESTION 2: SUBTRACTION

KEY IDEAS

For the following questions show your working and explain your chosen strategy.

a) Subtract 673 from 8000

b) What is the difference between 5500 and 339?

c) Mariam saved $30 000 to buy a new car. The basic model costs $25 999 and she added tinted windows for $860 and Bluetooth connectivity for $1375. What is the total cost of the car?

Does she have enough money to buy the car? _____

Explain why. _____

_____

_____

_____

_____

_____

_____

Select and apply efficient mental and written strategies for addition of numbers of any size

Solve word problems and record the strategy used, including problems involving money

Select and apply efficient mental and written strategies to solve word problems and record the strategy used

Stage 3: Multiplication and Division

Name: _____ Class: _____ Date: _____

STAGE 3: MULTIPLICATION AND DIVISION

QUESTION 1: MULTIPLICATION AND DIVISION

KEY IDEAS

For the following questions show your working and explain your chosen strategy.

a) 673 x 4 =

b) 258 ÷ 6 =

c) 425 x 36 =

d) 587 ÷ 6 =

e) What is the product of 524 and 40?

f) Divide 5600 by 10

g) 237 x 100 =

h) 6874 ÷ 100 =

Use and record a range of mental and written strategies to multiply by one- and two-digit operators

Use the formal algorithm for multiplication by one- and two-digit operators

Use and record a range of mental and written strategies to divide numbers with three or more digits by a one-digit operator, including problems that result in a remainder

Name: _____ Class: _____

STAGE 3: MULTIPLICATION AND DIVISION

QUESTION 2: PROBLEM SOLVING

KEY IDEAS

For the following questions show your working and explain your chosen strategy.

a) In a restaurant 6 people can sit around a table. Jack invited 84 people to the restaurant for his birthday. How many tables will Jack need?

b) Fish costs $15.50 per kilogram at the local fish market. Jenny purchases 3 kg of fish. How much is the total cost of the fish?

c) How long would it take to travel 6000 km if the average speed for the trip is 75 km/h?

d) There were 86 Smarties in a packet.
They were shared equally among 6 people.
How many did each person get?
And were there any left over?

Solve word problems and record the strategy used

Select and apply efficient mental and written strategies to solve word problems and record the strategy used

Interpret remainders in division problems

Use estimation to check answers to calculations

Name: _____ Class: _____

STAGE 3: MULTIPLICATION AND DIVISION

QUESTION 3: GROUPING SYMBOLS AND ORDER OF OPERATIONS

KEY IDEAS

Recognise and use grouping symbols

Apply the order of operations in calculations

Select and apply efficient mental and written strategies to solve word problems and record the strategy used

For the following questions show your working.

a) 6 + (4 x 6) =

b) (2 + 5) x (9 - 3) =

c) 4 + [16 ÷ (5 – 3)] =

d) Why do we use grouping symbols?

e) Are grouping symbols necessary for this number sentence? 25 + (5 x 3) _____

Explain why or why not. _____

_____

QUESTION 4: PROBLEM SOLVING

KEY IDEAS

Recognise and use grouping symbols

Apply the order of operations in calculations

Select and apply efficient mental and written strategies to solve word problems and record the strategy used

Show your working and explain your strategy.

I bought five plants for $9 each and three more for $12 each. What is the total cost?

Write a number sentence for this problem.

_____

Stage 3: Fractions and Decimals

Name: _____ Class: _____ Date: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 1: ORDERING FRACTIONS

KEY IDEAS

Compare and order unit fractions with denominators 2, 3, 4, 5, 6, 8, 10, 12 and 100

a) Place the following fractions on the number line below $\frac{1}{2}, \frac{3}{5}, \frac{1}{10}, \frac{7}{10}, \frac{2}{5}$

b) Place the following fractions on the number line below $\frac{3}{4}, \frac{1}{2}, \frac{2}{8}, \frac{5}{8}, \frac{6}{8}$

QUESTION 2: EQUIVALENT FRACTIONS

KEY IDEAS

Write fractions in their 'simplest form'

Write these fractions in their simplest form and explain how you worked it out.

a) $\frac{4}{8}$

b) $\frac{9}{12}$

Write an equivalent fraction for each of these fractions.

Determine, generate and record equivalent fractions

c) $\frac{2}{8} =$ _____

d) $\frac{3}{4} =$ _____

e) $\frac{6}{18} =$ _____

f) $\frac{5}{10} =$ _____

g) $\frac{8}{12} =$ _____

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 3: MIXED NUMERALS

KEY IDEAS

Express mixed numerals as improper fractions and vice versa

Write these fractions as mixed numerals and explain how you worked it out.

a) $\frac{14}{8}$

b) $\frac{10}{3}$

QUESTION 4: IMPROPER FRACTIONS

KEY IDEAS

Express mixed numerals as improper fractions and vice versa

a) Write this mixed numeral as an improper fraction.

$2\frac{7}{8} =$ _____

b) Draw a diagram to represent this mixed numeral.

c) Convert this mixed numeral to an improper fraction. Explain your chosen strategy.

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 5: ADDING AND SUBTRACTING FRACTIONS

KEY IDEAS

Model and represent strategies to add and subtract fractions with the same denominator

Add and subtract fractions, included mixed numerals, with the same or related denominators

Complete the following.

a) $\frac{2}{3} + \frac{1}{6} =$

Explain your chosen strategy.

_____

_____

_____

Draw a diagram to show how you worked it out.

b) $2\frac{1}{5} + \frac{4}{5} =$

Explain your chosen strategy.

_____

_____

_____

Draw a diagram to show how you worked it out.

c) $\frac{9}{10} - \frac{1}{5} =$

Explain your chosen strategy.

_____

_____

_____

Draw a diagram to show how you worked it out.

d) $1\frac{2}{3} - \frac{1}{3} =$

Explain your chosen strategy.

_____

_____

_____

Draw a diagram to show how you worked it out.

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 6: PROBLEM SOLVING

KEY IDEAS

For the following questions show your working and explain your chosen strategy.

a) Two people ate one pizza costing $16. Joe ate ¼ of the pizza and Sam ate ¾ of the pizza. What would each person pay for their share of the pizza?

Solve word problems involving fractions and decimals, including money problems

b) I went shopping and bought three items totaling $12.65. The first item cost $4.80 and the second item cost $6.21. What was the value of the third item?

c) Five lengths of timber measured 1.55 m each. What was the total length of the five timbers altogether?

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 7: MULTIPLYING FRACTIONS

KEY IDEAS

Multiply fractions by whole numbers

Solve the following.

a) $\frac{2}{3} \times 4 =$

Explain your chosen strategy.

_____

_____

_____

b) $2 \times \frac{4}{5} =$

Explain your chosen strategy.

_____

_____

_____

QUESTION 8: UNIT FRACTIONS OF COLLECTION

KEY IDEAS

Find a simple fraction of a quantity

Solve the following.

a) $\frac{1}{4}$ of 20 =

Explain your chosen strategy.

_____

_____

_____

b) $\frac{3}{5}$ of 15 =

Explain your chosen strategy.

_____

_____

_____

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 9: DECIMAL PLACE VALUE

KEY IDEAS

Make connections between equivalent percentages, fractions and decimals

Represent these fractions as decimals.

a) $\frac{236}{1000}$ = _____ b) $\frac{409}{1000}$ = _____ c) $\frac{71}{1000}$ = _____

Represent these decimals as fractions.

d) 0.359 = _____ e) 0.703 = _____ f) 0.048 = _____

QUESTION 10: PLACE VALUE AND ROUNDING DECIMALS

KEY IDEAS

Apply the place value system to represent thousandths as decimals

What is the value of the following digits in the decimal **1.563**

a) 5 = _____

b) 6 = _____

c) 3 = _____

Round to the nearest whole number.

d) 0.85 = _____ e) 1.46 = _____ f) 7.58 = _____ g) 10.75 = _____

QUESTION 11: COMPARING AND ORDERING DECIMALS

KEY IDEAS

Compare, order and represent decimals with up to three decimal places

a) Circle the largest decimal. 0.6 , 0.26 , 0.601 , 0.06

b) Circle the smallest decimal. 0.6 , 0.26 , 0.601 , 0.06

c) Place the following decimals on the number line below between 0 and 1

.5 .30 .75 .19 .95

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 12: ADDING AND SUBTRACTING DECIMALS

KEY IDEAS

Use mental and written strategies to add and subtract decimals with up to three decimal places

For the following questions show your working and explain your chosen strategy.

a) 0.04 + 1.35 =

b) 12.068 + 2.92 =

c) 3.55 – 1.06 =

d) 10.409 – 2.007 =

QUESTION 13: MULTIPLYING AND DIVIDING DECIMALS

KEY IDEAS

Use mental and written strategies to multiply decimals by one- and two- digit whole numbers

Multiply and divide decimals by 10, 100 and 1000

For the following questions show your working and explain your chosen strategy.

a) 2.02 x 4 =

b) 0.025 x 1000 =

c) 7.5 ÷ 10 =

d) 12.03 ÷ 100 =

Name: _____ Class: _____

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 14: COMPARING EQUIVALENT DECIMALS, FRACTIONS AND PERCENTAGES

KEY IDEAS

Make connections between equivalent percentages, fractions and decimals

Complete the following table by writing in the equivalent fractions, decimals and percentages.

FRACTION	DECIMAL	PERCENTAGE
$\frac{4}{8}$		
	0.75	
		25%

QUESTION 15: PROBLEM SOLVING

KEY IDEAS

Solve word problems involving fractions and decimals, including money problems

Use mental and written strategies to calculate 10%, 25% and 50% of quantities, including as discounts

For the following questions show your working and explain your chosen strategy.

a) 10% of $400

b) 25% of 200

c) What is the sale price if the retail cost is $45.00 and there is a 20% discount?

Stage 3: Patterns and Algebra

Name: _____ Class: _____ Date: _____

STAGE 3: PATTERNS AND ALGEBRA

QUESTION 1: INCREASING AND DECREASING PATTERNS

KEY IDEAS

Identify, continue, create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers

Continue the following number patterns.

a) 16, 23, 30, 37, 44, _____, _____, _____, _____, _____, _____

Describe the pattern. _____

b) 94, 86, 78, 70, 62, 54, 46, _____, _____, _____, _____, _____, _____

Describe the pattern. _____

c) 3.3, 3.0, 2.7, 2.4, 2.1, 1.8 , _____, _____, _____, _____, _____, _____

Describe the pattern, _____

d) $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{16}$, _____ , _____ , _____ , _____

Describe the pattern. _____

QUESTION 2: NUMBER RELATIONSHIPS

KEY IDEAS

Find missing numbers in number sentences involving multiplication or division on one or both sides of the equals sign

Identify and use inverse operations to solve these number sentences.

a) 80 ÷ 4 = ☐ so ☐ x 4 = 80 b) 12 x 5 = ☐ so ☐ ÷ 5 = 12

QUESTION 3: EQUIVALENT NUMBER SENTENCES

Calculate the missing numbers in these number sentences.

a) 6 x ☐ = 2 x 9 b) 6 + 10 = 4 x ☐

QUESTION 4: MISSING ELEMENTS IN PATTERNS

KEY IDEAS

Continue, create, record and describe geometric and number patterns in words

Complete the table of values for this geometric pattern. △ , △△ , △△△ , △△△△ , ...

NUMBER OF TRIANGLES	1	2	3	4						10
NUMBER OF SIDES	3	6	9	12						

Describe the pattern. _____

_____

_____

Name: _____ Class: _____

STAGE 3: PATTERNS AND ALGEBRA

QUESTION 5: ANALYSE AND DESCRIBE NUMBER PATTERNS IN A TABLE

KEY IDEAS

Continue, create, record and describe geometric and number patterns in words

Determine the rule for geometric and number patterns in words and use the rule to calculate values

Complete the table of values for this number pattern.

POSITION OF PATTERN	1	2	3	4	5	6	7	8	9
VALUE OF TERM	4	8	12	16					

Describe the pattern. _____

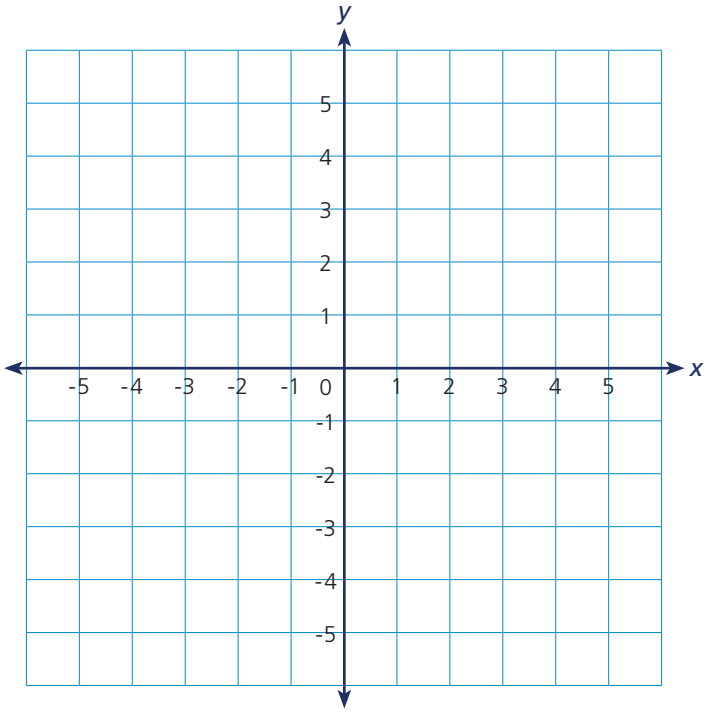
_____

QUESTION 6: USING A NUMBER PLANE TO DESCRIBE LOCATION ON A GRID

KEY IDEAS

Locate and record the coordinates of points in all four quadrants of the Cartesian plane

Plot the following points on the number plane.



point A (0, 5) point B (4, 2) point C (4, -4) point D (-4, 4)

point E (-4, 2) point F (3, 5) point G (4, 5)

What are the coordinates for the point of origin? _____

Explain why the order of the coordinates is important when locating points on the plane.

_____

_____

Stage 3: Length

Name: _____ Class: _____ Date: _____

STAGE 3: LENGTH

QUESTION 1: UNITS FOR MEASURING LENGTH

KEY IDEAS

Convert between kilometres, metres, centimetres and millimetres

a) List some of the units of measure for length _____

_____

b) How many metres in 1 kilometre? _____

c) How many metres in 2.5 kilometres? _____

QUESTION 2: CONVERTING UNITS OF MEASUREMENT

KEY IDEAS

Convert between kilometres, metres, centimetres

Convert the following lengths to metres or centimetres.

a) 1.3 m = _____ cm

b) 6.05 m = _____ cm

c) 2.075 km = _____ m

d) 10.19 km = _____ m

QUESTION 3: DECIMAL NOTATION

KEY IDEAS

Record lengths and distances using decimal notation to three decimal places

Record these lengths using decimal notation.

a) 14 cm and 6 mm = _____ cm

b) 7 cm and 8 mm = _____ cm

c) 3 m and 55 cm = _____ m

d) 25 m and 78 cm = _____ m

QUESTION 4: PROBLEM SOLVING

KEY IDEAS

Solve problems involving length and perimeter

Show your working and explain your chosen strategy.

There were three pieces of cut ribbon. The first measured 15 mm, the second measured 8.5 cm and the third measured 1.5 m. What is the total length of the three pieces of ribbon in metres?

Name: _____ Class: _____

STAGE 3: LENGTH

QUESTION 5: UNDERSTANDING PERIMETER

KEY IDEAS

How would you calculate the perimeter of a two-dimensional shape? _____

_____

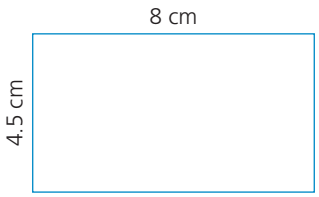
_____

Find perimeters of common two-dimensional shapes and record the strategy

Calculate the perimeter of the following shapes.
(Shapes are not to scale)

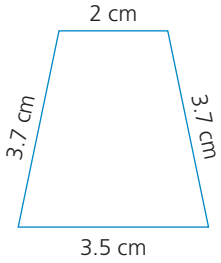
Solve problems involving length and perimeter

a)



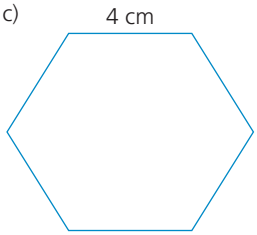
Perimeter _____

b)



Perimeter _____

c)



Perimeter _____

QUESTION 6: PROBLEM SOLVING

KEY IDEAS

Show your working and explain your chosen strategy.

Solve problems involving length and perimeter

a) Draw a two-dimensional shape with a perimeter of 20 cm. Label all side lengths.
(Diagrams do not need to be drawn to scale)

b) Draw a two-dimensional shape with a perimeter of 36 cm. Label all side lengths.
(Diagrams do not need to be drawn to scale)

Stage 3: Area

Name: _____ Class: _____ Date: _____

STAGE 3: AREA

QUESTION 1: UNIT STRUCTURE OF AREA

KEY IDEAS

Recognise the need for square kilometres and hectares to measure area

a) What does area mean? _____

_____

b) How would you calculate the area of a rectangle?
(Use a diagram and words to explain your answer)

c) When might you use square kilometres to measure area? _____

_____

_____

d) How many square metres = 1 hectare (ha)? _____ m²

QUESTION 2: CALCULATING AREA

KEY IDEAS

Solve problems involving areas of rectangles (including squares)

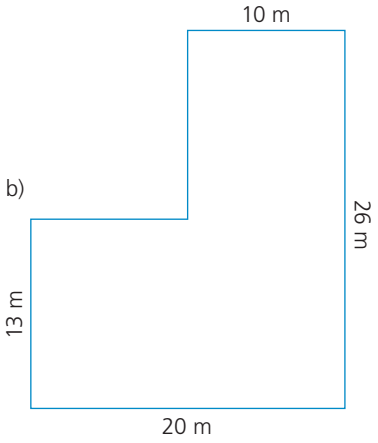
Develop a strategy to find areas of rectangles (including squares) and record the strategy in words

Calculate the areas of the following shapes.
(Shapes are not to scale)

a)

Area = _____

b)



Area = _____

Explain how you worked out the area of shape **b**.

_____

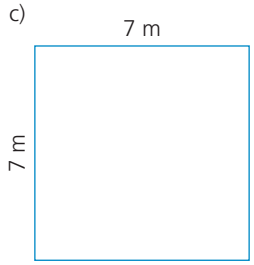
_____

_____

_____

_____

c)



Area = _____

Name: _____ Class: _____

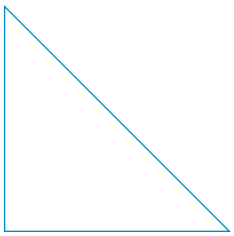
STAGE 3: AREA

QUESTION 3: AREAS OF TRIANGLES

KEY IDEAS

Develop a strategy to find areas of triangles and record the strategy in words

a) Label the **base** and **perpendicular height** on the triangle.



b) How would you calculate the area of a triangle? Use the above diagram to explain your thinking.

_____

_____

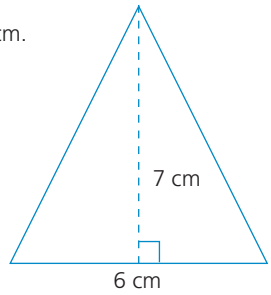
_____

QUESTION 4: AREAS OF TRIANGLES

KEY IDEAS

Solve problems involving areas of triangles

The base of this triangle measures 6 cm and the perpendicular height is 7 cm. What is the area of this triangle? Show your working out.



QUESTION 5: RELATIONSHIP BETWEEN AREA AND PERIMETER

KEY IDEAS

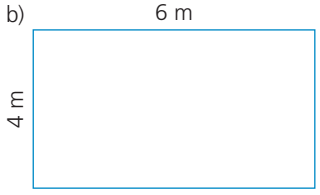
Solve problems involving areas of rectangles (including squares)

Both these rectangles have the same perimeter. What is the area of each rectangle?

a)

Area = _____

b)



Area = _____

c) Draw another rectangle with the same perimeter (20 m) but with a different area. (Your diagram doesn't need to be to scale)

Stage 3: Volume and Capacity

Name: _____ Class: _____ Date: _____

STAGE 3: VOLUME AND CAPACITY

QUESTION 1: UNIT STRUCTURE OF VOLUME

KEY IDEAS

Connect volume and the units of measurement

a) What does volume mean? _____

_____

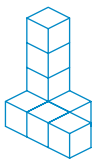
b) List some units of measurement for volume. _____

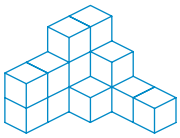
QUESTION 2: CALCULATING VOLUME

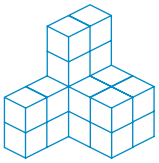
KEY IDEAS

Use cubic centimetres and cubic metres to measure and estimate volumes

How many cubic centimetres were used to create the following shapes?







a) _____ b) _____ c) _____

QUESTION 3: FINDING VOLUME

KEY IDEAS

Develop a strategy to find volumes of rectangular prisms and record the strategy in words

Record volumes using cm^3 and m^3

What is the volume of this rectangle? Show and explain your working.

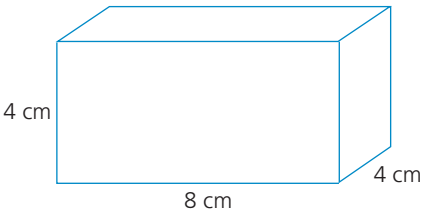
_____

_____

_____

_____

_____



QUESTION 4: FINDING VOLUME

KEY IDEAS

Develop a strategy to find volumes of rectangular prisms and record the strategy in words

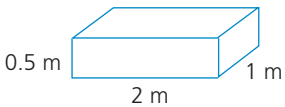
Explain why both of the prisms below have a volume of 1 m^3.

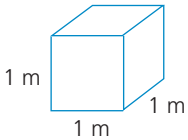
_____

_____

_____

Draw another prism with different dimensions which has a volume of 1 m^3?





Name: _____ Class: _____

STAGE 3: VOLUME AND CAPACITY

QUESTION 5: UNIT STRUCTURE OF CAPACITY

KEY IDEAS

Connect capacity and the units of measurement

a) What does capacity mean? _____

_____

b) List some units of measure for capacity. _____

_____

QUESTION 6: UNIT STRUCTURE OF CAPACITY AND CALCULATING CAPACITY

KEY IDEAS

Record volumes and capacities using decimal notation to three decimal places

What is the measuring capacity of this jug.

a) in millilitres? _____

b) in litres? _____

c) A recipe requires you to pour 3.5 L of water.

Explain how you would use this jug to measure that amount of water.

_____

_____

_____

_____

QUESTION 7: CONVERTING UNITS OF MEASUREMENT

KEY IDEAS

Convert between millilitres and litres

Convert the following units to millilitres or litres.

a) 5.3 L = _____ mL

b) 10.25 L = _____ mL

c) 7056 mL= _____ L

d) 5308 mL = _____ L

QUESTION 8: CONVERTING UNITS OF MEASUREMENT

KEY IDEAS

Record volumes and capacities using decimal notation to three decimal places

Record the following units using decimal notation up to three decimal places.

a) 4 litres and 600 millilitres = _____ L

b) 15 litres and 75 millilitres = _____ L

c) 48 litres and 705 millilitres = _____ L

Stage 3: Mass

Name: _____ Class: _____ Date: _____

STAGE 3: MASS

QUESTION 1: UNIT STRUCTURE OF MASS

KEY IDEAS

Convert between tonnes, kilograms and grams

a) How many grams in 1 kilogram? _____

b) How many kilograms in 1 tonne? _____

QUESTION 2: UNDERSTANDING MASS

KEY IDEAS

Distinguish between 'gross mass' and 'net mass'

Solve problems involving mass

a) Explain the difference between gross mass and net mass and give an example.

_____

_____

_____

b) The mass of a packet of biscuits is 250 g. The packaging weighs 30 g of the 250 g. If there are 10 identical biscuits in the packet, how much does each biscuit weigh?

QUESTION 3: CONVERTING UNITS OF MEASUREMENT

KEY IDEAS

Convert between kilograms and grams

Convert the following units to kilograms or grams.

a) 1.5 kg = _____ g

b) 15.68 kg = _____ g

c) 1.5 tonnes = _____ kg

d) 15.05 t = _____ kg

QUESTION 4: CONVERTING UNITS OF MEASUREMENT

KEY IDEAS

Record mass using decimal notation to three decimal places

Record the following units using decimal notation up to three decimal places.

a) 9 kilograms and 56 grams = _____ kg

b) 275 kilograms and 750 grams = _____ kg

QUESTION 5: PROBLEM SOLVING

KEY IDEAS

Solve problems involving mass

Show your working and explain your chosen strategy.

My shopping bag had three items of various masses. The flour (1.5 kg), eggs (700 g) and a chocolate bar (55 g). What is the total mass of the three items in kg?

Stage 3: Time

Name: _____ Class: _____ Date: _____

STAGE 3: TIME

QUESTION 1: CONVERTING TIME

KEY IDEAS

Convert between 12- and 24-hour time

Convert these to 24-hour time.

a) 10:30 am _____

b) 2:45 pm _____

c) 6:15 am _____

d) 8:00 pm _____

Convert these to 12-hour time.

e) 0930 h _____

f) 1615 h _____

g) 1145 h _____

h) 2230 h _____

QUESTION 2: DURATION

KEY IDEAS

Determine and compare the duration of events

Sam left home at 7:35 am and arrived at school at 8:15 am. His first class began at 8:45 am and finished at 9:35 am. His next class started at 10 am and finished at 10:45 am.

a) How long did it take Sam to get to school? _____

b) What was the total length of time for the two morning classes? _____

c) What was the length of his break between morning classes? _____

d) If Sam arrived home at 4 pm, how long had he been away from home? _____

_____

QUESTION 3: TIME ZONES

KEY IDEAS

Determine and compare the duration of events

This map shows the difference between Australian time zones.

a) How many hours difference is there between the west coast and the east coast?

_____

_____

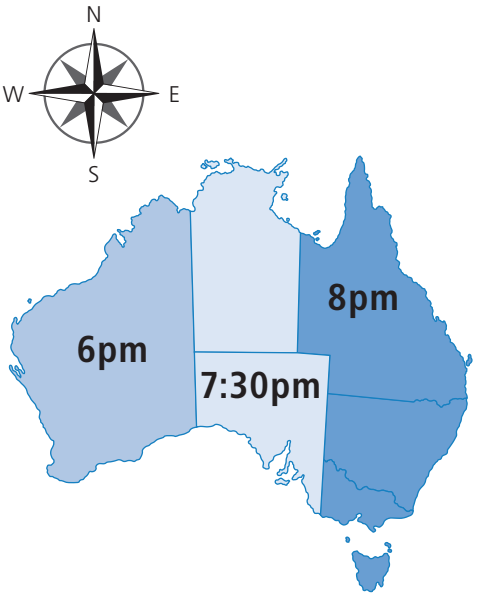
_____

b) If it is 10 am on the east coast, what time would it be on the west coast?

_____

_____

_____



Name: _____ Class: _____

STAGE 3: TIME

QUESTION 4: INTERPRETING TIMETABLES

KEY IDEAS

Interpret and use timetables

Use the following train timetable to answer the questions below.

T4 Eastern Suburbs & Illawarra Line: Waterfall or Cronulla to Bondi Junction

Services departing Waterfall from 03:00 06:00 09:00 12:00 15:00 18:00 21:00 00:00 Next day

Stations											
Waterfall	---	14:24	---	---	---	---	---	15:00	---	---	
Heathcote	---	14:29	---	---	---	---	---	15:05	---	---	
Engadine	---	14:32	---	---	---	---	---	15:08	---	---	
Loftus	---	14:36	---	---	---	---	---	15:12	---	---	
Cronulla	14:18	---	14:33	---	14:48	---	---	---	---	15:03	
Wooloowware	14:20	---	14:35	---	14:50	---	---	---	---	15:05	
Caringbah	14:23	---	14:38	---	14:53	---	---	---	---	15:08	
Miranda	14:25	---	14:40	---	14:55	---	---	---	---	15:10	---
Gymea	14:28	---	14:43	---	14:58	---	---	---	---	15:13	---
Kirrawee	14:30	---	14:45	---	15:00	---	---	---	---	15:15	---
Sutherland	14:34	14:39	14:49	---	15:04	---	---	15:15	---	15:19	---
Jannali	14:36	---	14:51	---	15:06	---	---	---	---	15:21	---
Como	---	---	14:54	---	---	---	---	---	---	15:24	---
Oatley	14:42	---	14:58	---	15:12	---	---	---	---	15:28	---
Mortdale	---	14:46	15:00	14:56	---	15:03	---	15:22	---	15:30	15:26
Penshurst	---	14:48	15:02	14:58	---	15:05	---	15:24	---	15:32	15:28
Hurstville	14:47	14:51	15:05	15:01	15:17	15:11	15:24	15:27	15:21	15:35	15:31
Allawah	---	14:53	---	15:04	---	15:14	---	---	15:24	---	15:34
Carlton	---	14:55	---	15:06	---	15:16	---	---	15:26	---	15:36
Kogarah	14:51	14:57	---	15:08	---	15:18	---	---	15:28	---	15:38
Rockdale	14:53	14:59	---	15:10	---	15:20	---	---	15:30	---	15:40
Banksia	---	15:01	---	15:12	---	15:22	---	---	15:32	---	15:42
Arncliffe	---	15:03	---	15:14	---	15:24	---	---	15:34	---	15:44
Wolli Creek	14:57	15:06	15:12	15:17	15:24	15:27	15:31	15:34	15:37	15:42	15:47
Tempe	---	15:07	---	15:18	---	15:28	---	---	15:38	---	15:48
Sydenham	15:00	15:10	---	15:21	---	15:31	---	---	15:41	---	15:51
Redfern	15:06	15:16	15:22	15:27	15:34	15:37	15:40	15:44	15:47	15:52	15:57
Central	15:09	15:19	15:25	15:30	15:37	15:40	15:43	15:47	15:50	15:55	16:00
Town Hall	15:12	15:22	15:28	15:33	15:40	15:43	15:46	15:50	15:53	15:58	16:03
Martin Place	15:14	15:24	15:30	15:35	15:42	15:45	15:48	15:52	15:55	16:00	16:05
Kings Cross	15:16	15:26	15:32	15:37	15:44	15:47	15:50	15:54	15:57	16:02	16:07
Edgecliff	15:19	15:29	15:35	15:40	15:47	15:50	15:53	15:57	16:00	16:05	16:10
Bondi Junction	15:22	15:32	15:38	15:43	15:50	15:53	15:56	16:00	16:03	16:08	16:13

EARLIER TRAINS

LATER TRAINS

http://www.sydneytrains.info/timetables/timetables_by_line.htm#landingPoint

Image reproduced by kind permission of Transport for NSW

a) If I caught the 3:12 pm train from Oatley, at what time would I arrive at Town Hall station?

_____

b) How long would the train journey take? _____

c) If I needed to arrive at Central before 4 pm, give two possible trains I could catch from Hurstville?

_____ _____

d) Which of those two trains would you catch and why? _____

_____

_____

Stage 3: Three-Dimensional Space

Name: _____ Class: _____ Date: _____

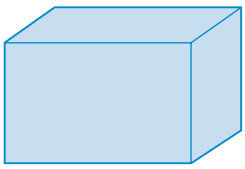
STAGE 3: THREE-DIMENSIONAL SPACE

QUESTION 1: SPATIAL UNDERSTANDING

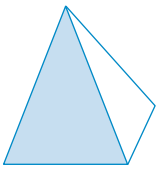
KEY IDEAS

Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices

Draw a line from the word to indicate a face, edge and vertex on the following two 3D objects.



FACE
APEX
EDGE
VERTEX



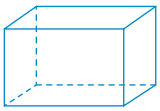
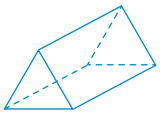
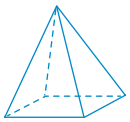
QUESTION 2: UNDERSTANDING PROPERTIES OF 3D OBJECTS

KEY IDEAS

Name prisms and pyramids according to the shape of their 'base'

Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices

a) Complete the following table identifying the name of objects and the number of faces, edges and vertices.

3D OBJECT	NAME	NUMBER OF FACES	NUMBER OF EDGES	NUMBER OF VERTICES
				
				
				

b) Look at the objects above; describe what is similar about the properties of these objects.

_____

_____

_____

QUESTION 3: COMPARING PRISMS AND PYRAMIDS

KEY IDEAS

Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices

Describe the difference between a prism and a pyramid.

_____

_____

_____

_____

Name: _____ Class: _____

STAGE 3: THREE-DIMENSIONAL SPACE

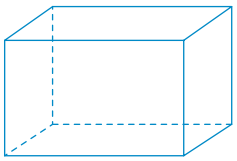
QUESTION 4: VISUALISATION

KEY IDEAS

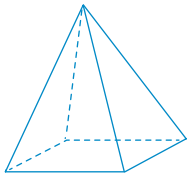
Connect three-dimensional objects with their nets

a) Draw a net for the following 3D objects.

(i)



(ii)

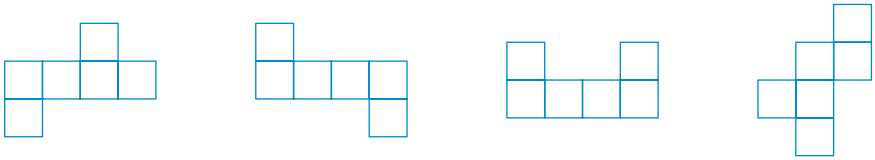


b) Draw a net for a.

(i) Square pyramid

(ii) Pentagonal prism

c) Which of these is **not** a net for a 3D object? Circle your answer.



Name: _____ Class: _____

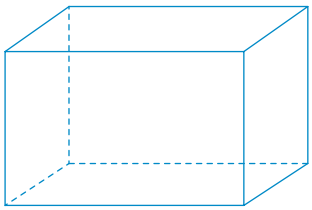
STAGE 3: THREE-DIMENSIONAL SPACE

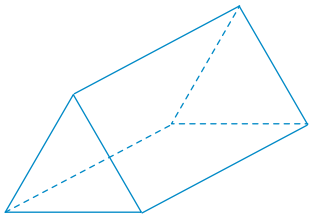
QUESTION 5: VISUALISING CROSS-SECTIONS

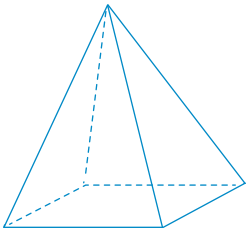
KEY IDEAS

Recognise the differences between the cross-sections of prisms and pyramids

a) Draw a line to show the cross-section of the following 3D objects.







b) Draw the shape created by this cross-section.

c) If I cut a cross-section of an object and the resulting shape was a circle, what object could it be? Why?

_____

_____

d) How are the cross-sections of a pyramid different to a prism?

_____

_____

_____

_____

Stage 3: Two-Dimensional Space

Name: _____ Class: _____ Date: _____

STAGE 3: TWO-DIMENSIONAL SPACE

QUESTION 1: PROPERTIES OF TRIANGLES

KEY IDEAS

Identify, name and draw triangles

Compare and describe side properties of special triangles

Identify and name the following triangles and list their properties.

TRIANGLE	NAME	PROPERTIES

QUESTION 2: CLASSIFYING AND DRAWING 2D SHAPES

KEY IDEAS

Classify and draw regular and irregular two-dimensional shapes from descriptions of their features

Read the following descriptions and identify and draw the shape.

a) I have four equal sides and four right angles.

Shape name: _____

b) I have four sides, the two opposite sides are equal, and four right angles.

Shape name: _____

c) I have four equal sides and opposite angles are equal.

Shape name: _____

d) I am a polygon with eight sides and eight angles.

Shape name: _____

QUESTION 3: DRAWING REGULAR AND IRREGULAR 2D SHAPES

KEY IDEAS

Classify and draw regular and irregular two-dimensional shapes from descriptions of their features

a) Draw a regular hexagon.

b) Draw an irregular hexagon.

Name: _____ Class: _____

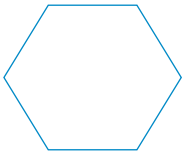
STAGE 3: TWO-DIMENSIONAL SPACE

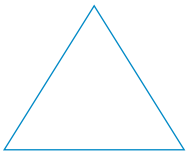
QUESTION 4: LINE SYMMETRY

KEY IDEAS

Identify line symmetries

Draw and write the number of axes of symmetry for the following shapes.





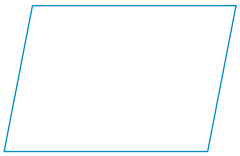
_____ _____ _____

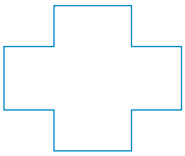
QUESTION 5: ROTATIONAL SYMMETRY

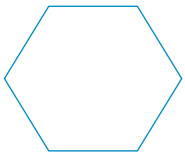
KEY IDEAS

Identify rotational symmetries

Write the order of rotational symmetry for the following shapes.







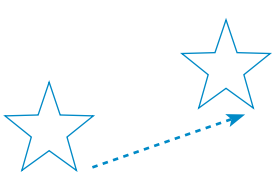
_____ _____ _____

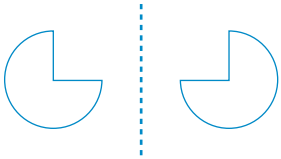
QUESTION 6: TRANSFORMATIONS

KEY IDEAS

Use the terms 'translate', 'reflect' and 'rotate' to describe transformations of shapes

Label the following as a reflection, translation or rotation.





_____ _____ _____

Name: _____ Class: _____

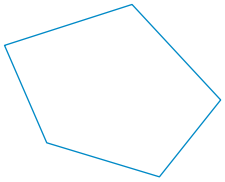
STAGE 3: TWO-DIMENSIONAL SPACE

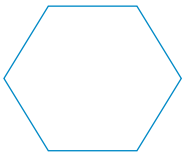
QUESTION 7: DIAGONALS

KEY IDEAS

Identify, describe, compare and draw diagonals of two-dimensional shapes

Draw and write the number of diagonals on the following shapes.





_____ _____ _____

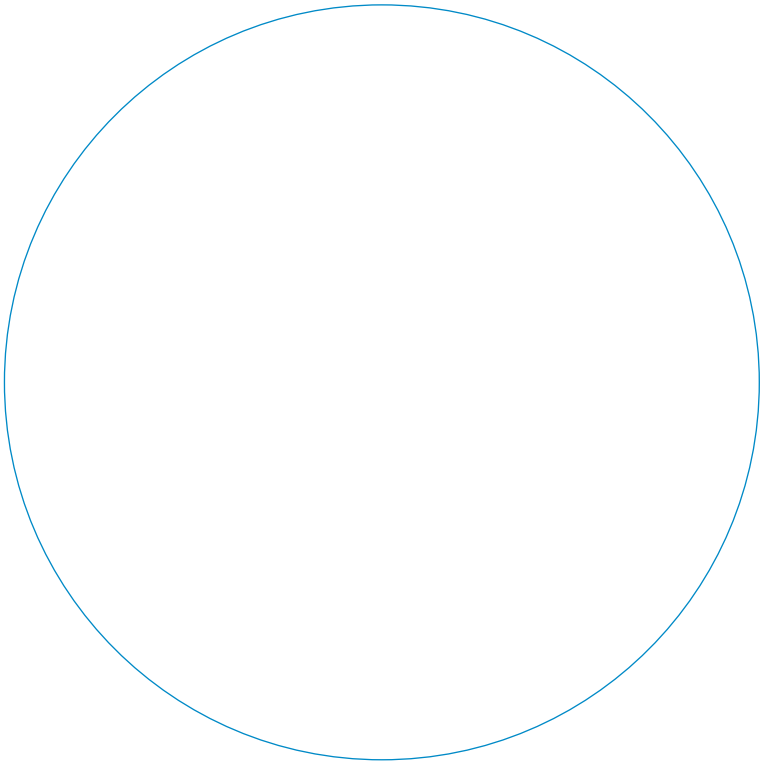
QUESTION 8: CIRCLE GEOMETRY

KEY IDEAS

Identify and name parts of circles

Draw and label the following parts of a circle on the diagram below.

centre radius diameter quadrant circumference sector semi-circle



Stage 3: Angles

Name: _____ Class: _____ Date: _____

STAGE 3: ANGLES

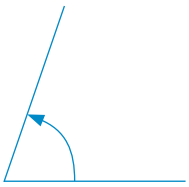
QUESTION 1: MEASURING ANGLES

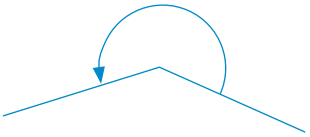
KEY IDEAS

Use a protractor to measure and find the size of the following angles.

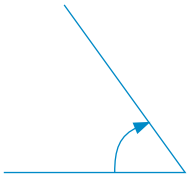
Measure, compare and estimate angles in degrees (up to 360°)

Record angle measurements using the symbol for degrees (°)

a) _____ 

b) _____ 

c) _____

d) _____ 

QUESTION 2: KNOWLEDGE OF ANGLES

KEY IDEAS

a) How many degrees are in a right angle? _____

b) How many degrees are in a straight angle? _____

c) How many degrees are in a revolution? _____

d) How many straight angles are in two full rotations? _____

e) How many right angles are in a straight angle? _____

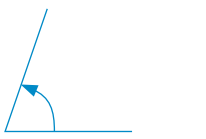
Describe angle size in degrees for each angle classification

QUESTION 3: ANGLE CLASSIFICATION

KEY IDEAS

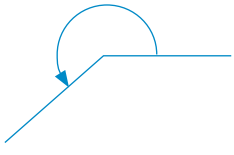
Name the following types of angles.

Describe angle size in degrees for each angle classification



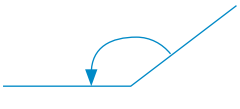
_____

_____



_____

_____



_____

_____

Name: _____ Class: _____

STAGE 3: ANGLES

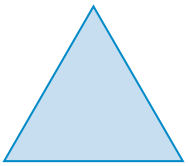
QUESTION 4: ESTIMATING AND MEASURING ANGLES

KEY IDEAS

Describe angle size in degrees for each angle classification

Use a protractor to measure the angles of each shape. Write the type of angle and the size in degrees.

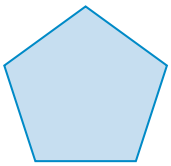
Triangle

a) 

Square

b)

Pentagon

c) 

Size of angle:

_____ _____ _____

Type of angle:

_____ _____ _____

QUESTION 5: CONSTRUCTING ANGLES

KEY IDEAS

Construct angles using a protractor (up to 360°)

Use a protractor to draw the following angles.

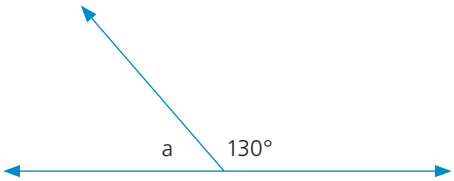
75°

160°

QUESTION 6: IDENTIFYING ANGLES

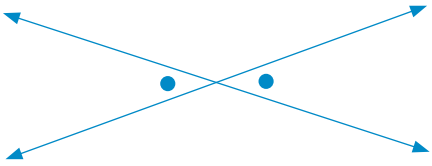
KEY IDEAS

Identify and name angle types formed by the intersection of lines



a) What is the size of angle a?

_____



b) Describe the angles with the dots.

_____

_____

_____

_____

Name: _____ Class: _____

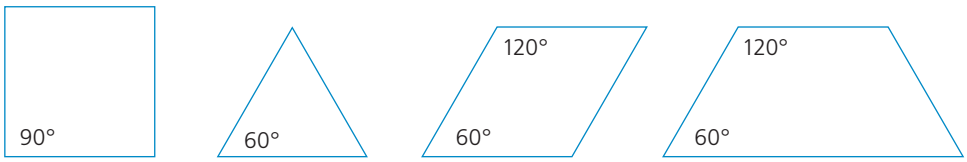
STAGE 3: ANGLES

QUESTION 7: PROBLEM SOLVING WITH ANGLES

KEY IDEAS

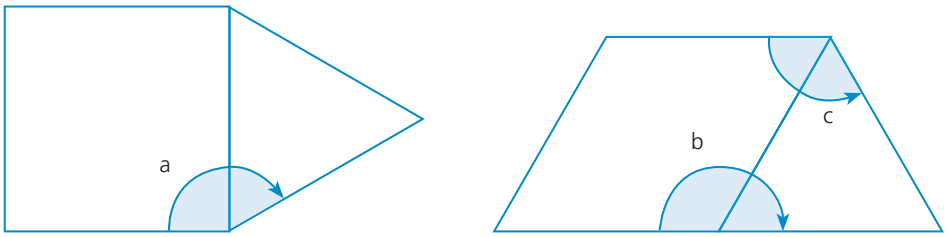
Use known angle results to find unknown angles in diagrams

These pattern blocks have been labelled with angle sizes.



Square Triangle Rhombus Trapezium

a) Using the information above, work out the size of the angles in these combined shapes.



a = _____ b = _____ c = _____

b) What pattern blocks could you combine to make an angle of 360°?

_____

_____

c) Draw these shapes together to show the 360° angle.

Stage 3: Data

Name: _____ Class: _____ Date: _____

STAGE 3: DATA

QUESTION 1: USING DATA TO CREATE GRAPHS

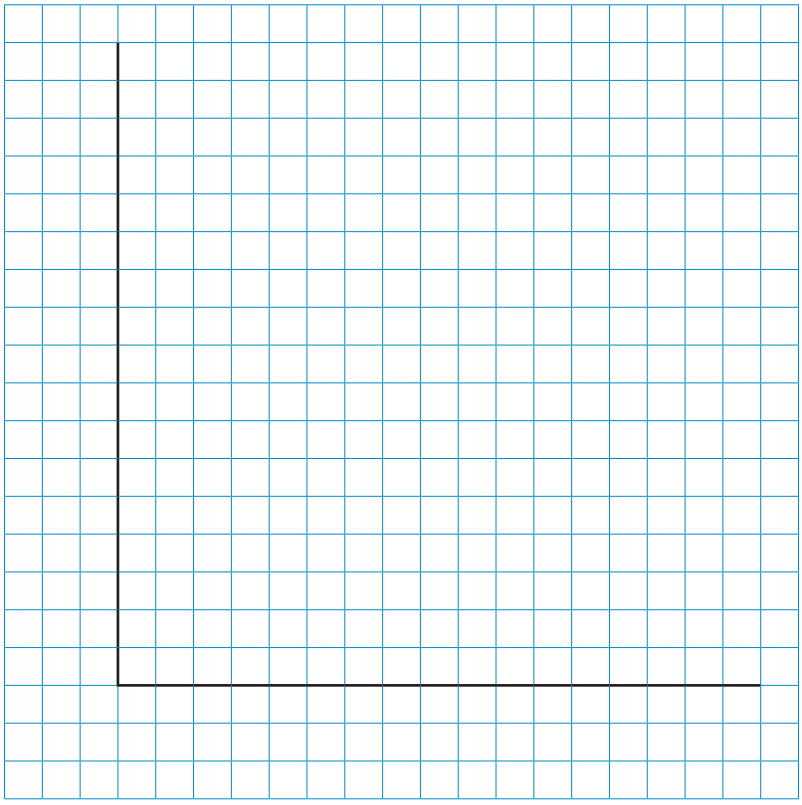
KEY IDEAS

Construct data displays, including tables, column graphs, dot plots and line graphs, appropriate for the data type

Use the following data to create a side-by-side column graph.

DRINKS	BOYS	GIRLS
Water	5	10
Soft drink	11	6
Milk	5	2
Juice	6	6
Cordial	3	4

COLUMN GRAPH (SIDE-BY-SIDE)
Ensure you label your graph



Name: _____ Class: _____

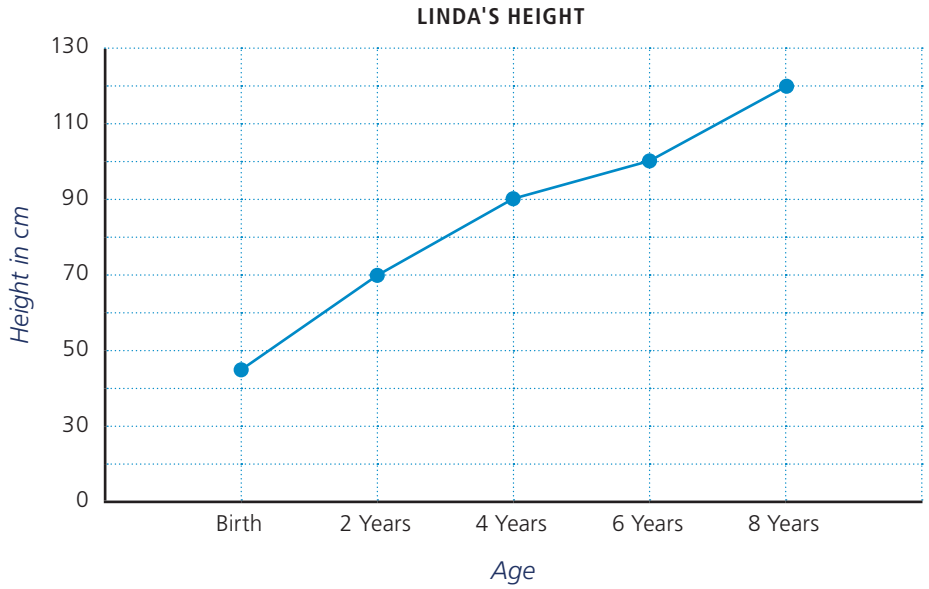
STAGE 3: DATA

QUESTION 2: LINE GRAPHS

KEY IDEAS

Describe and interpret data presented in tables, column graphs, dot plots and line graphs

Look at the information in the line graph below and answer the following questions.



a) What was Linda's height at birth? Approximately _____

b) How many cm did Linda grow between 2 years old and 6 years old? _____

c) How tall was Linda when she was 3 years old? _____

d) If Linda continues to grow 5 cm each year, how tall will Linda be when she is 10 years old?

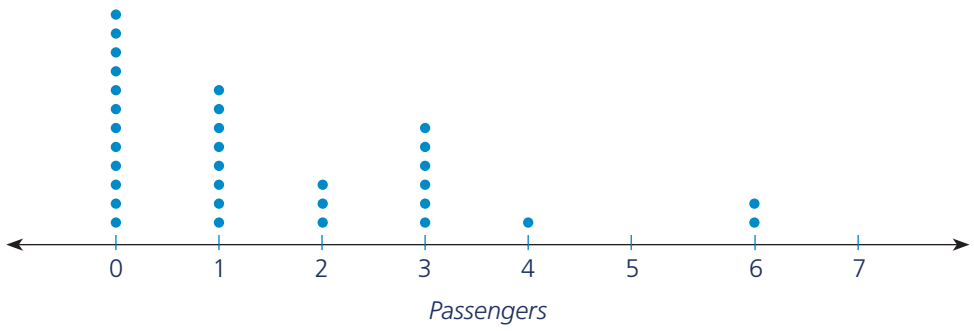
_____

QUESTION 3: DOT PLOTS

KEY IDEAS

Describe and interpret data presented in tables, column graphs, dot plots and line graphs

This dot plot shows the number of passengers in 32 cars stopped at a traffic light.



a) How many cars had three passengers? _____

b) How many cars only had a driver? _____

Stage 3: Chance

Name: _____ Class: _____ Date: _____

STAGE 3: CHANCE

QUESTION 1: LANGUAGE OF CHANCE

KEY IDEAS

List outcomes of chance experiments involving equally likely outcomes

Describe the probability of the following events as **likely**, **unlikely** or **equally likely**.

a) I will brush my teeth today. _____

b) I will toss a coin and it lands on tails. _____

c) I will pull out a black bead from a bag containing 10 black beads and 2 white beads. _____

d) I will trip over as I walk down a path. _____

e) I will talk to my friends today. _____

f) I will eat an ice cream with a movie star this afternoon. _____

QUESTION 2: REPRESENTING PROBABILITY

KEY IDEAS

Represent probabilities using fractions

Represent the probability using fractions in the following chance experiments.

a) Throwing a '4' on a standard six-sided dice. _____

b) Tossing a coin and landing on heads. _____

c) The spinner landing on the star. _____

QUESTION 3: LANGUAGE OF CHANCE

KEY IDEAS

Recognise that probabilities range from 0 to 1

Write the following chance words on this number line where '0' is impossible and '1' is certain.

definitely	maybe	sure	even	unlikely	likely	possibly	never	50/50

IMPOSSIBLE — CERTAIN

0 — 1

Name: _____ Class: _____

STAGE 3: CHANCE

QUESTION 4: CONCEPT: FREQUENCY

KEY IDEAS

Compare observed frequencies in chance experiments with expected frequencies

The table below shows the frequency of a dice being rolled.

DICE NUMERAL						
Number of times rolled	4	14	2	8	10	3
Total number of rolls						41

a) Which number was rolled most frequently? _____

b) Explain in your own words why you think each number was not rolled equally.

_____

_____

_____

QUESTION 5: REPRESENTING PROBABILITIES

KEY IDEAS

Represent probabilities using fractions, decimals and percentages

Represent the term 'a one in two' chance as:

a) a fraction _____

b) a decimal _____

c) a percentage _____

Notes

Notes

Notes