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 within 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.
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

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read, write and order numbers of any size</td>
</tr>
</tbody>
</table>

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

__________________________ ____________________________ __________________________

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 ______________________

d) Write each number in expanded notation.

825 = ____________________ + ____________________ + ____________________

64 350 = ____________________ + ____________________ + ____________________ + ____________________ + ____________________ + ____________________

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

__________________________ ____________________________ __________________________

QUESTION 2: ROUNDING

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read, write and order numbers of any size</td>
</tr>
</tbody>
</table>

a) Round 43 520 to the nearest thousand. ____________________

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

QUESTION 3: READING AND WRITING NUMBERS

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Read, write and order numbers of any size</td>
</tr>
</tbody>
</table>

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. ____________________

QUESTION 4: FACTORS

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine factors and multiples of whole numbers</td>
</tr>
</tbody>
</table>

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 ____________________

QUESTION 5: MULTIPLES

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Determine factors and multiples of whole numbers</td>
</tr>
</tbody>
</table>

a) List all the multiples of 8 under 100 ____________________

b) List the lowest common multiple of 48 and 24 ____________________
STAGE 3: WHOLE NUMBERS

QUESTION 6: INTEGERS

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

![Number Line]

0

-4 -3 -2 -1 0 1 2 3 4

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

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

QUESTION 7: 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.

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

QUESTION 8: SQUARE AND TRIANGULAR NUMBERS

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

Square numbers

1 4 9 ____________ ____________ ____________

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

Triangular numbers

1 3 6 ____________ ____________ ____________
## Stage 3: Addition & Subtraction

Name: ________________  Class: ________________  Date: ________________

### STAGE 3: ADDITION & SUBTRACTION

#### QUESTION 1: ADDITION

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Find the sum of 6587 and 329</td>
<td>b) Find the total of these three numbers. 589, 4026 and 3904</td>
</tr>
<tr>
<td>c) If a computer costs $1599 and its price was increased by $350, how much is the new price?</td>
<td>d) Katie had $2650 in her bank account. After a deposit, her account increased by $475. How much is in Katie’s account now?</td>
</tr>
<tr>
<td>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?</td>
<td>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?</td>
</tr>
</tbody>
</table>

### KEY IDEAS

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: ADDITION & SUBTRACTION

QUESTION 2: SUBTRACTION

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 $60 and Bluetooth connectivity for $1375. What is the total cost of the car?

Does she have enough money to buy the car? ________

Explain why. _________________________________

_______________________________

_______________________________

_______________________________

_______________________________

_______________________________
Stage 3: Multiplication and Division

Name: ___________________________  Class: _____________  Date: __________

STAGE 3: MULTIPLICATION AND DIVISION

QUESTION 1: MULTIPLICATION AND DIVISION

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a)</strong> 673 x 4 =</td>
<td><strong>b)</strong> 258 ÷ 6 =</td>
</tr>
<tr>
<td><strong>c)</strong> 425 x 36 =</td>
<td><strong>d)</strong> 587 ÷ 6 =</td>
</tr>
<tr>
<td><strong>e)</strong> What is the product of 524 and 40?</td>
<td><strong>f)</strong> Divide 5600 by 10</td>
</tr>
<tr>
<td><strong>g)</strong> 237 x 100 =</td>
<td><strong>h)</strong> 6874 ÷ 100 =</td>
</tr>
</tbody>
</table>

KEY IDEAS

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.
**STAGE 3: MULTIPLICATION AND DIVISION**

**QUESTION 2: PROBLEM SOLVING**

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

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
</tr>
</thead>
<tbody>
<tr>
<td>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?</td>
<td>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?</td>
</tr>
<tr>
<td>c) How long would it take to travel 6000 km if the average speed for the trip is 75 km/h?</td>
<td>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?</td>
</tr>
</tbody>
</table>

**KEY IDEAS**

- 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
### STAGE 3: MULTIPLICATION AND DIVISION

#### QUESTION 3: GROUPING SYMBOLS AND ORDER OF OPERATIONS

For the following questions show your working.

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognise and use grouping symbols</td>
<td>a) ( 6 + (4 \times 6) = )</td>
</tr>
<tr>
<td>Apply the order of operations in calculations</td>
<td>b) ( (2 + 5) \times (9 - 3) = )</td>
</tr>
<tr>
<td>Select and apply efficient mental and written strategies to solve word problems and record the strategy used</td>
<td></td>
</tr>
<tr>
<td>c) ( 4 + [16 + (5 - 3)] = )</td>
<td>d) Why do we use grouping symbols?</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>e) Are grouping symbols necessary for this number sentence? ( 25 + (5 \times 3) )</td>
<td>______</td>
</tr>
<tr>
<td>Explain why or why not.</td>
<td>______</td>
</tr>
</tbody>
</table>

#### QUESTION 4: PROBLEM SOLVING

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?

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recognise and use grouping symbols</td>
<td>Write a number sentence for this problem.</td>
</tr>
<tr>
<td>Apply the order of operations in calculations</td>
<td></td>
</tr>
<tr>
<td>Select and apply efficient mental and written strategies to solve word problems and record the strategy used</td>
<td></td>
</tr>
</tbody>
</table>

Write a number sentence for this problem.
Stage 3: Fractions and Decimals

Name: ______________________  Class: ______________________  Date: ______________________

STAGE 3: FRACTIONS AND DECIMALS

QUESTION 1: ORDERING FRACTIONS

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

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.

c) $\frac{2}{8} = \underline{\hspace{2cm}}$

d) $\frac{3}{4} = \underline{\hspace{2cm}}$

e) $\frac{6}{18} = \underline{\hspace{2cm}}$

f) $\frac{5}{10} = \underline{\hspace{2cm}}$

g) $\frac{8}{12} = \underline{\hspace{2cm}}$
STAGE 3: FRACTIONS AND DECIMALS

QUESTION 3: MIXED NUMERALS

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

a) \( \frac{14}{8} \)  
b) \( \frac{10}{3} \)

KEY IDEAS

Express mixed numerals as improper fractions and vice versa

QUESTION 4: IMPROPER FRACTIONS

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.
### STAGE 3: FRACTIONS AND DECIMALS

#### QUESTION 5: ADDING AND SUBTRACTING FRACTIONS

Complete the following.

<table>
<thead>
<tr>
<th>a) ( \frac{2}{3} + \frac{1}{6} )</th>
<th>b) ( \frac{2}{5} + \frac{4}{5} )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Explain your chosen strategy.</td>
<td>Explain your chosen strategy.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw a diagram to show how you worked it out.</td>
<td>Draw a diagram to show how you worked it out.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>c) ( \frac{9}{10} - \frac{1}{5} )</td>
<td>d) ( \frac{2}{3} - \frac{1}{3} )</td>
</tr>
<tr>
<td>Explain your chosen strategy.</td>
<td>Explain your chosen strategy.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Draw a diagram to show how you worked it out.</td>
<td>Draw a diagram to show how you worked it out.</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KEY IDEAS**

- Model and represent strategies to add and subtract fractions with the same denominator.
- Add and subtract fractions, including mixed numerals, with the same or related denominators.
**STAGE 3: FRACTIONS AND DECIMALS**

**QUESTION 6: PROBLEM SOLVING**

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

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Solve word problems involving fractions and decimals, including money problems</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>a) Two people ate one pizza costing $16. Joe ate ¼ of the pizza and Sam ate ⅕ of the pizza. What would each person pay for their share of the pizza?</th>
</tr>
</thead>
<tbody>
<tr>
<td>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?</td>
</tr>
<tr>
<td>c) Five lengths of timber measured 1.55 m each. What was the total length of the five timbers altogether?</td>
</tr>
</tbody>
</table>
### STAGE 3: FRACTIONS AND DECIMALS

#### QUESTION 7: MULTIPLYING FRACTIONS

Solve the following.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) ( \frac{2}{3} \times 4 = )</td>
<td>b) ( 2 \times \frac{4}{5} = )</td>
</tr>
</tbody>
</table>

Explain your chosen strategy.

Explain your chosen strategy.

#### QUESTION 8: UNIT FRACTIONS OF COLLECTION

Solve the following.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) ( \frac{1}{4} ) of 20 =</td>
<td>b) ( \frac{3}{5} ) of 15 =</td>
</tr>
</tbody>
</table>

Explain your chosen strategy.

Explain your chosen strategy.
STAGE 3: FRACTIONS AND DECIMALS

QUESTION 9: DECIMAL PLACE VALUE

Represent these fractions as decimals.

\[ \frac{236}{1000} = \quad \quad \frac{409}{1000} = \quad \quad \frac{71}{1000} = \]

KEY IDEAS

Make connections between equivalent percentages, fractions and decimals

Represent these decimals as fractions.

\[ 0.359 = \quad \quad 0.703 = \quad \quad 0.048 = \]

QUESTION 10: PLACE VALUE AND Rounding DECIMALS

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

\[ a) \quad 5 = \quad \quad b) \quad 6 = \quad \quad c) \quad 3 = \]

KEY IDEAS

Apply the place value system to represent thousands as decimals

Round to the nearest whole number.

\[ d) \quad 0.85 = \quad \quad e) \quad 1.46 = \quad \quad f) \quad 7.58 = \quad \quad g) \quad 10.75 = \]

QUESTION 11: COMPARING AND ORDERING DECIMALS

\[ a) \quad \text{Circle the largest decimal.} \quad 0.6, \quad 0.26, \quad 0.601, \quad 0.06 \]

\[ b) \quad \text{Circle the smallest decimal.} \quad 0.6, \quad 0.26, \quad 0.601, \quad 0.06 \]

\[ c) \quad \text{Place the following decimals on the number line below between 0 and 1} \]

\[ .5 \quad .30 \quad .75 \quad .19 \quad .95 \]

\[ \]

KEY IDEAS

Compare, order and represent decimals with up to three decimal places
### STAGE 3: FRACTIONS AND DECIMALS

#### QUESTION 12: ADDING AND SUBTRACTING DECIMALS

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $0.04 + 1.35 =$</td>
<td>b) $12.068 + 2.92 =$</td>
</tr>
<tr>
<td>c) $3.55 - 1.06 =$</td>
<td>d) $10.409 - 2.007 =$</td>
</tr>
</tbody>
</table>

#### KEY IDEAS

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

#### QUESTION 13: MULTIPLYING AND DIVIDING DECIMALS

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) $2.02 \times 4 =$</td>
<td>b) $0.025 \times 1000 =$</td>
</tr>
<tr>
<td>c) $7.5 \div 10 =$</td>
<td>d) $12.03 \div 100 =$</td>
</tr>
</tbody>
</table>

#### 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.
**STAGE 3: FRACTIONS AND DECIMALS**

**QUESTION 14: COMPARING EQUIVALENT DECIMALS, FRACTIONS AND PERCENTAGES**

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

<table>
<thead>
<tr>
<th>FRACTION</th>
<th>DECIMAL</th>
<th>PERCENTAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\frac{4}{8}$</td>
<td>0.75</td>
<td>25%</td>
</tr>
</tbody>
</table>

**KEY IDEAS**

- Make connections between equivalent percentages, fractions and decimals

**QUESTION 15: PROBLEM SOLVING**

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?

**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
Stage 3: Patterns and Algebra

Name: ___________________________ Class: ___________________________ Date: ___________________________

STAGE 3: PATTERNS AND ALGEBRA

QUESTION 1: INCREASING AND DECREASING PATTERNS

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

Identify and use inverse operations to solve these number sentences.

a) \( 80 \div 4 = \) ______ so \( \square \times 4 = 80 \) \( b) 12 \times 5 = \) ______ so \( \square \div 5 = 12 \)

QUESTION 3: EQUIVALENT NUMBER SENTENCES

Calculate the missing numbers in these number sentences.

a) \( 6 \times \square = 2 \times 9 \) \( b) 6 + 10 = 4 \times \square \)

QUESTION 4: MISSING ELEMENTS IN PATTERNS

Complete the table of values for this geometric pattern. \( \triangle, \triangle \triangle, \triangle \triangle \triangle, \triangle \triangle \triangle \triangle, \ldots \)

<table>
<thead>
<tr>
<th>NUMBER OF TRIANGLES</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF SIDES</td>
<td>3</td>
<td>6</td>
<td>9</td>
<td>12</td>
<td></td>
</tr>
</tbody>
</table>

Describe the pattern.

Continued, create, record and describe geometric and number patterns in words.

KEY IDEAS

- Identify, continue, create and describe increasing and decreasing number patterns with fractions, decimals and whole numbers.
- Find missing numbers in number sentences involving multiplication or division on one or both sides of the equals sign.
- Continue, create, record and describe geometric and number patterns in words.
STAGE 3: PATTERNS AND ALGEBRA

QUESTION 5: ANALYSE AND DESCRIBE NUMBER PATTERNS IN A TABLE

Complete the table of values for this number pattern.

<table>
<thead>
<tr>
<th>POSITION OF PATTERN</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>VALUE OF TERM</td>
<td>4</td>
<td>8</td>
<td>12</td>
<td>16</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Describe the pattern: ________________________________

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continue, create, record and describe geometric and number patterns in words</td>
</tr>
<tr>
<td>Determine the rule for geometric and number patterns in words and use the rule to calculate values</td>
</tr>
</tbody>
</table>

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

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.

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Locate and record the coordinates of points in all four quadrants of the Cartesian plane</td>
</tr>
</tbody>
</table>

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Stage 3: Length

Name: ___________________________ Class: ___________ Date: ___________

STAGE 3: LENGTH

QUESTION 1: UNITS FOR MEASURING LENGTH

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

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

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

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?

KEY IDEAS

- Convert between kilometres, metres, centimetres and millimetres
- Convert between kilometres, metres, centimetres
- Record lengths and distances using decimal notation to three decimal places
- Solve problems involving length and perimeter
STAGE 3: LENGTH

**QUESTION 5: UNDERSTANDING PERIMETER**

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

---

KEY IDEAS

- Find perimeters of common two-dimensional shapes and record the strategy.
- Solve problems involving length and perimeter.

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

a) 
![Diagram of a rectangle with sides 4.5 cm and 8 cm]

Perimeter __________

b) 
![Diagram of a trapezoid with sides 2 cm, 3.7 cm, 3.5 cm, and 3 cm]

Perimeter __________

c) 
![Diagram of a hexagon with sides 4 cm]

Perimeter __________

**QUESTION 6: PROBLEM SOLVING**

Show your working and explain your chosen strategy.

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

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

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

a)  

\[ \text{Area} = \]  

b)  

\[ \text{Area} = \]  

Explain how you worked out the area of shape b.

________________________________________

________________________________________

________________________________________

________________________________________

________________________________________
STAGE 3: AREA

QUESTION 3: AREAS OF TRIANGLES

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

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

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

a) 8 m

Area = ________________

b) 6 m

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)

KEY IDEAS

- Develop a strategy to find areas of triangles and record the strategy in words
- Solve problems involving areas of triangles
- Solve problems involving areas of rectangles (including squares)
Stage 3: Volume and Capacity

Name: ____________________  Class: __________  Date: __________

STAGE 3: VOLUME AND CAPACITY

QUESTION 1: UNIT STRUCTURE OF VOLUME

a) What does volume mean? ________________________________

b) List some units of measurement for volume. ________________

KEY IDEAS
Connect volume and the units of measurement

QUESTION 2: CALCULATING VOLUME

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

a) ____________________  b) ____________________  c) ____________________

KEY IDEAS
Use cubic centimetres and cubic metres to measure and estimate volumes

QUESTION 3: FINDING VOLUME

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

______________________________
______________________________
______________________________
______________________________

KEY IDEAS
Develop a strategy to find volumes of rectangular prisms and record the strategy in words
Record volumes using cm³ and m³

QUESTION 4: FINDING VOLUME

Explain why both of the prisms below have a volume of 1 m³.

______________________________
______________________________

Draw another prism with different dimensions which has a volume of 1 m³?

0.5 m 2 m 1 m

1 m

1 m
**STAGE 3: VOLUME AND CAPACITY**

**QUESTION 5: UNIT STRUCTURE OF CAPACITY**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a) What does capacity mean?</td>
<td>Connect capacity and the units of measurement</td>
</tr>
<tr>
<td>b) List some units of measure for capacity.</td>
<td></td>
</tr>
</tbody>
</table>

**QUESTION 6: UNIT STRUCTURE OF CAPACITY AND CALCULATING CAPACITY**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>What is the measuring capacity of this jug.</td>
<td>Record volumes and capacities using decimal notation to three decimal places</td>
</tr>
<tr>
<td>a) in millilitres?</td>
<td></td>
</tr>
<tr>
<td>b) in litres?</td>
<td></td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
</tbody>
</table>

**QUESTION 7: CONVERTING UNITS OF MEASUREMENT**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Convert the following units to millilitres or litres.</td>
<td>Convert between millilitres and litres</td>
</tr>
<tr>
<td>a) 5.3 L = ______ millilitres</td>
<td></td>
</tr>
<tr>
<td>b) 10.25 L = ______ millilitres</td>
<td></td>
</tr>
<tr>
<td>c) 7056 mL = ______ L</td>
<td></td>
</tr>
<tr>
<td>d) 5308 mL = ______ L</td>
<td></td>
</tr>
</tbody>
</table>

**QUESTION 8: CONVERTING UNITS OF MEASUREMENT**

<table>
<thead>
<tr>
<th>KEY IDEAS</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Record the following units using decimal notation up to three decimal places.</td>
<td>Record volumes and capacities using decimal notation to three decimal places</td>
</tr>
<tr>
<td>a) 4 litres and 600 millilitres = ______ L</td>
<td></td>
</tr>
<tr>
<td>b) 15 litres and 75 millilitres = ______ L</td>
<td></td>
</tr>
<tr>
<td>c) 48 litres and 705 millilitres = ______ L</td>
<td></td>
</tr>
</tbody>
</table>
Stage 3: Mass

Name: ____________________________ Class: ___________ Date: ___________

## STAGE 3: MASS

### QUESTION 1: UNIT STRUCTURE OF MASS

**KEY IDEAS**

| a) How many grams in 1 kilogram? ________________________________ | Convert between tonnes, kilograms and grams |
| b) How many kilograms in 1 tonne? ________________________________ |

### QUESTION 2: UNDERSTANDING MASS

**KEY IDEAS**

| 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 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 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**

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**

Convert these to 24-hour time.

<table>
<thead>
<tr>
<th>a) 10:30 am</th>
<th>Convert these to 12-hour time.</th>
</tr>
</thead>
<tbody>
<tr>
<td>b) 2:45 pm</td>
<td>e) 0930 h</td>
</tr>
<tr>
<td>c) 6:15 am</td>
<td>f) 1615 h</td>
</tr>
<tr>
<td>d) 8:00 pm</td>
<td>g) 1145 h</td>
</tr>
<tr>
<td></td>
<td>h) 2230 h</td>
</tr>
</tbody>
</table>

Convert between 12- and 24-hour time

**KEY IDEAS**

**QUESTION 2: DURATION**

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? ___________________________

**KEY IDEAS**

Determine and compare the duration of events

**QUESTION 3: TIME ZONES**

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? ___________________________

**KEY IDEAS**

Determine and compare the duration of events
STAGE 3: TIME

QUESTION 4: INTERPRETING TIMETABLES

Use the following train timetable to answer the questions below.

![Train Timetable](http://www.sydneytrain.info/timetables/timetable_by_line.html#landingFront)

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**

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

**FACE**

**APEX**

**EDGE**

**VERTEX**

**KEY IDEAS**

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

**QUESTION 2: UNDERSTANDING PROPERTIES OF 3D OBJECTS**

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

<table>
<thead>
<tr>
<th>3D OBJECT</th>
<th>NAME</th>
<th>NUMBER OF FACES</th>
<th>NUMBER OF EDGES</th>
<th>NUMBER OF VERTICES</th>
</tr>
</thead>
</table>

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

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

**QUESTION 3: COMPARING PRISMS AND PYRAMIDS**

Describe the difference between a prism and a pyramid.

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

**KEY IDEAS**

Describe and compare properties of prisms and pyramids in terms of their faces, edges and vertices.
### QUESTION 4: VISUALISATION

<table>
<thead>
<tr>
<th>Key Ideas</th>
<th>Question</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connect three-dimensional objects with their nets</td>
<td></td>
</tr>
</tbody>
</table>

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

(i) [Net of a cube](#)

(ii) [Net of a triangular prism](#)

#### 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.

- [Net 1](#)
- [Net 2](#)
- [Net 3](#)
- [Net 4](#)
### STAGE 3: THREE-DIMENSIONAL SPACE

#### QUESTION 5: VISUALISING CROSS-SECTIONS

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>a)</strong> Draw a line to show the cross-section of the following 3D objects.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image1.png" alt="Diagram of a cube with a cross-section line" /></td>
</tr>
<tr>
<td><strong>b)</strong> Draw the shape created by this cross-section.</td>
<td></td>
</tr>
<tr>
<td></td>
<td><img src="image2.png" alt="Diagram of a cross-section of a cube" /></td>
</tr>
<tr>
<td><strong>c)</strong> If I cut a cross-section of an object and the resulting shape was a circle, what object could it be? Why?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>________</td>
</tr>
<tr>
<td><strong>d)</strong> How are the cross-sections of a pyramid different to a prism?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>________</td>
</tr>
</tbody>
</table>

#### KEY IDEAS

- Recognise the differences between the cross-sections of prisms and pyramids.
Stage 3: Two-Dimensional Space

Name: ___________________________  Class: ___________________  Date: ____________

### QUESTION 1: PROPERTIES OF TRIANGLES

Identify and name the following triangles and list their properties.

<table>
<thead>
<tr>
<th>TRIANGLE</th>
<th>NAME</th>
<th>PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td>Triangle</td>
<td>Identify, name and draw triangles</td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td>Triangle</td>
<td>Compare and describe side properties of special triangles</td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td>Triangle</td>
<td></td>
</tr>
<tr>
<td><img src="image" alt="Triangle" /></td>
<td>Triangle</td>
<td></td>
</tr>
</tbody>
</table>

### QUESTION 2: CLASSIFYING AND DRAWING 2D SHAPES

Read the following descriptions and identify and draw the shape.

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

Shape name: ___________________________  Shape name: ___________________________

- **c)** I have four equal sides and opposite angles are equal.
- **d)** I am a polygon with eight sides and eight angles.

Shape name: ___________________________  Shape name: ___________________________

### QUESTION 3: DRAWING REGULAR AND IRREGULAR 2D SHAPES

- **a)** Draw a regular hexagon.
- **b)** Draw an irregular hexagon.

Classify and draw regular and irregular two-dimensional shapes from descriptions of their features.
### STAGE 3: TWO-DIMENSIONAL SPACE

#### QUESTION 4: LINE SYMMETRY

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

<table>
<thead>
<tr>
<th>Shape</th>
<th>Axes of Symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td>4</td>
</tr>
<tr>
<td>Hexagon</td>
<td>6</td>
</tr>
<tr>
<td>Triangle</td>
<td>3</td>
</tr>
</tbody>
</table>

#### KEY IDEAS

- Identify line symmetries

#### QUESTION 5: ROTATIONAL SYMMETRY

Write the order of rotational symmetry for the following shapes.

<table>
<thead>
<tr>
<th>Shape</th>
<th>Order of Rotational Symmetry</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rectangle</td>
<td>2</td>
</tr>
<tr>
<td>Cross</td>
<td>4</td>
</tr>
<tr>
<td>Hexagon</td>
<td>6</td>
</tr>
</tbody>
</table>

#### KEY IDEAS

- Identify rotational symmetries

#### QUESTION 6: TRANSFORMATIONS

Label the following as a reflection, translation or rotation.

- Star: Reflection
- Arrow: Translation
- Two Circles: Rotation

#### KEY IDEAS

- Use the terms 'translate', 'reflect' and 'rotate' to describe transformations of shapes
### STAGE 3: TWO-DIMENSIONAL SPACE

#### QUESTION 7: DIAGONALS

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

<table>
<thead>
<tr>
<th>Shape</th>
<th>Number of Diagonals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pentagon</td>
<td>5</td>
</tr>
<tr>
<td>Hexagon</td>
<td>9</td>
</tr>
</tbody>
</table>

#### KEY IDEAS

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

#### QUESTION 8: CIRCLE GEOMETRY

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

- Centre
- Radius
- Diameter
- Quadrant
- Circumference
- Sector
- Semi-circle

#### KEY IDEAS

- Identify and name parts of circles.
Stage 3: Angles

Name: ___________________________  Class: ____________  Date: ____________

---

**STAGE 3: ANGLES**

**QUESTION 1: MEASURING ANGLES**

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

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td></td>
</tr>
<tr>
<td>b)</td>
<td></td>
</tr>
<tr>
<td>c)</td>
<td></td>
</tr>
<tr>
<td>d)</td>
<td></td>
</tr>
</tbody>
</table>

**KEY IDEAS**
- Measure, compare and estimate angles in degrees (up to 360°)
- Record angle measurements using the symbol for degrees (°)

**QUESTION 2: KNOWLEDGE OF ANGLES**

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? ____________

**KEY IDEAS**
- Describe angle size for each angle classification

**QUESTION 3: ANGLE CLASSIFICATION**

Name the following types of angles.

---

**KEY IDEAS**
- Describe angle size in degrees for each angle classification
# STAGE 3: ANGLES

## QUESTION 4: ESTIMATING AND MEASURING ANGLES

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

<table>
<thead>
<tr>
<th>Triangle</th>
<th>Square</th>
<th>Pentagon</th>
</tr>
</thead>
<tbody>
<tr>
<td>a)</td>
<td>b)</td>
<td>c)</td>
</tr>
</tbody>
</table>

**Size of angle:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

**Type of angle:**

<p>| | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
</table>

## QUESTION 5: CONSTRUCTING ANGLES

Use a protractor to draw the following angles.

| 75° | 160° |

## QUESTION 6: IDENTIFYING ANGLES

a) What is the size of angle a?

b) Describe the angles with the dots.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>

Identify and name angle types formed by the intersection of lines.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
</table>
STAGE 3: ANGLES

QUESTION 7: PROBLEM SOLVING WITH ANGLES

These pattern blocks have been labelled with angle sizes.

<table>
<thead>
<tr>
<th>Angle</th>
<th>Shape</th>
</tr>
</thead>
<tbody>
<tr>
<td>90°</td>
<td>Square</td>
</tr>
<tr>
<td>60°</td>
<td>Triangle</td>
</tr>
<tr>
<td>120°</td>
<td>Rhombus</td>
</tr>
<tr>
<td>60°</td>
<td>Trapezium</td>
</tr>
</tbody>
</table>

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

```
  a

  b

  c
```

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

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

<table>
<thead>
<tr>
<th>DRINKS</th>
<th>BOYS</th>
<th>GIRLS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>5</td>
<td>10</td>
</tr>
<tr>
<td>Soft drink</td>
<td>11</td>
<td>6</td>
</tr>
<tr>
<td>Milk</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>Juice</td>
<td>6</td>
<td>6</td>
</tr>
<tr>
<td>Cordial</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>

COLUMN GRAPH (SIDE-BY-SIDE)

Ensure you label your graph.
STAGE 3: DATA

QUESTION 2: LINE GRAPHS

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

**LINDA'S HEIGHT**

<table>
<thead>
<tr>
<th>Age</th>
<th>Height in cm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Birth</td>
<td></td>
</tr>
<tr>
<td>2 Years</td>
<td></td>
</tr>
<tr>
<td>4 Years</td>
<td></td>
</tr>
<tr>
<td>6 Years</td>
<td></td>
</tr>
<tr>
<td>8 Years</td>
<td></td>
</tr>
</tbody>
</table>

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

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

<table>
<thead>
<tr>
<th>Passengers</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

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

<table>
<thead>
<tr>
<th>definitely</th>
<th>maybe</th>
<th>sure</th>
<th>even</th>
<th>unlikely</th>
<th>likely</th>
<th>possibly</th>
<th>never</th>
<th>50/50</th>
</tr>
</thead>
</table>

IMPOSSIBLE

0

CERTAIN

1
STAGE 3: CHANCE

QUESTION 4: CONCEPT: FREQUENCY

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

<table>
<thead>
<tr>
<th>DICE NUMERAL</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Number of times rolled</td>
<td>14</td>
</tr>
<tr>
<td></td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>3</td>
</tr>
<tr>
<td>Total number of rolls</td>
<td>41</td>
</tr>
</tbody>
</table>

a) Which number was rolled most frequently?

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

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QUESTION 5: REPRESENTING PROBABILITIES

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

a) a fraction ________________________

b) a decimal ________________________

c) a percentage ________________________

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KEY IDEAS

Compare observed frequencies in chance experiments with expected frequencies

Represent probabilities using fractions, decimals and percentages
Notes

__________________________________________
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