Mathematics

Year 5

Below Satisfactory

WORK SAMPLE PORTFOLIO

The 2012 portfolios are a resource to support teachers in planning and implementation of the Foundation to Year 10 Australian Curriculum in the learning area. Each portfolio comprises a collection of student work illustrating evidence of student learning in relation to the achievement standard. At every year level there are three portfolios illustrating satisfactory, above satisfactory and below satisfactory achievement in relation to the standard.

Each portfolio comprises a collection of different student work selected by state and territory nominees, and annotated and reviewed by classroom teachers and other curriculum experts. Each work sample in the portfolio varies in terms of how much time was available to complete the task and/or the degree of scaffolding provided by the teacher.

There is no pre-determined number of student work samples in a portfolio nor are they sequenced in any particular order. Together as a portfolio, the samples provide evidence of all aspects of the achievement standard unless otherwise specified.

As the Australian Curriculum is progressively implemented in schools, the portfolios will continue to be reviewed and enhanced in relation to their comprehensiveness in coverage of the achievement standard and their representation of the diversity of student work that can be used to highlight evidence of student learning.

THIS PORTFOLIO – Year 5 Mathematics

This portfolio comprises a number of work samples drawn from a range of assessment tasks, namely:

Sample 1	Geometry – My angle
Sample 2	Measurement – Garden bed
Sample 3	Number – Treasure Hunt
Sample 4	Measurement – How many can you make?
Sample 5	Number – Who are the fastest swimmers?
Sample 6	Measurement – Using time
Sample 7	Measurement – Using perimeter and area
Sample 8	Geometry – Location and transformation
Sample 9	Number – Number sentences
Sample10	Geometry – Mapping
Sample 11	Statistics and Probability – Come in spinner

This portfolio of student work shows the measurement and construction of different angles (WS1), comparison of the sizes of fractions by diagrams and calculation and their representation on a number line (WS2, WS5). The student solves problems using the four operations (WS3, WS9) and makes spinners to assist in carrying out simple probability experiments before evaluating the results (WS 11). The student investigates the areas and perimeters of different rectangles (WS7). The student explains the effect of transformations (WS8), locates axes of symmetry of shapes and describes the features of three-dimensional objects using two-dimensional representations (WS4). The student creates maps, locates landmarks and describes directions to locations (WS10). The student converts between 12 and 24 hour time (WS6).

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The annotated samples in this portfolio provide evidence of most (but not necessarily all) aspects of the achievement standard. The following aspect/s of the achievement standard are not evident in this portfolio:

- *explain plans for simple budgets*
- *compare and interpret different data sets*
- *use appropriate units of measurement for volume, capacity and mass*
- *assign probabilities between 0 and 1*
- *pose questions to gather data*
- *check the reasonableness of answers using estimation and rounding.*

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Geometry – My angle

Relevant parts of the achievement standard

By the end of Year 5, students solve simple problems involving the four operations using a range of strategies. They check the reasonableness of answers using estimation and rounding. Students identify and describe factors and multiples. They explain plans for simple budgets. Students connect three-dimensional objects with their two-dimensional representations. They describe transformations of two-dimensional shapes and identify line and rotational symmetry. Students compare and interpret different data sets.

Students order decimals and unit fractions and locate them on number lines. They add and subtract fractions with the same denominator. Students continue patterns by adding and subtracting fractions and decimals. They find unknown quantities in number sentences. They use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles. They convert between 12 and 24 hour time. Students use a grid reference system to locate landmarks. They measure and construct different angles. Students list outcomes of chance experiments with equally likely outcomes and assign probabilities between 0 and 1. Students pose questions to gather data, and construct data displays appropriate for the data.

Summary of task

Students had completed a unit of work on angles and their properties. They were given the following problems to solve:

- *Can you estimate and draw an angle of approximately 135° without using a protractor?*
- *I looked at the clock before school and noticed that the hands made an acute angle. What time could it be?*
- *I looked at the clock before school and noticed that the hands made a right angle. What time could it be? How do you know that you are right?*
- *I looked at the clock before school and noticed that the hands made a reflex angle. What time could it be? How do you know that you are right?*

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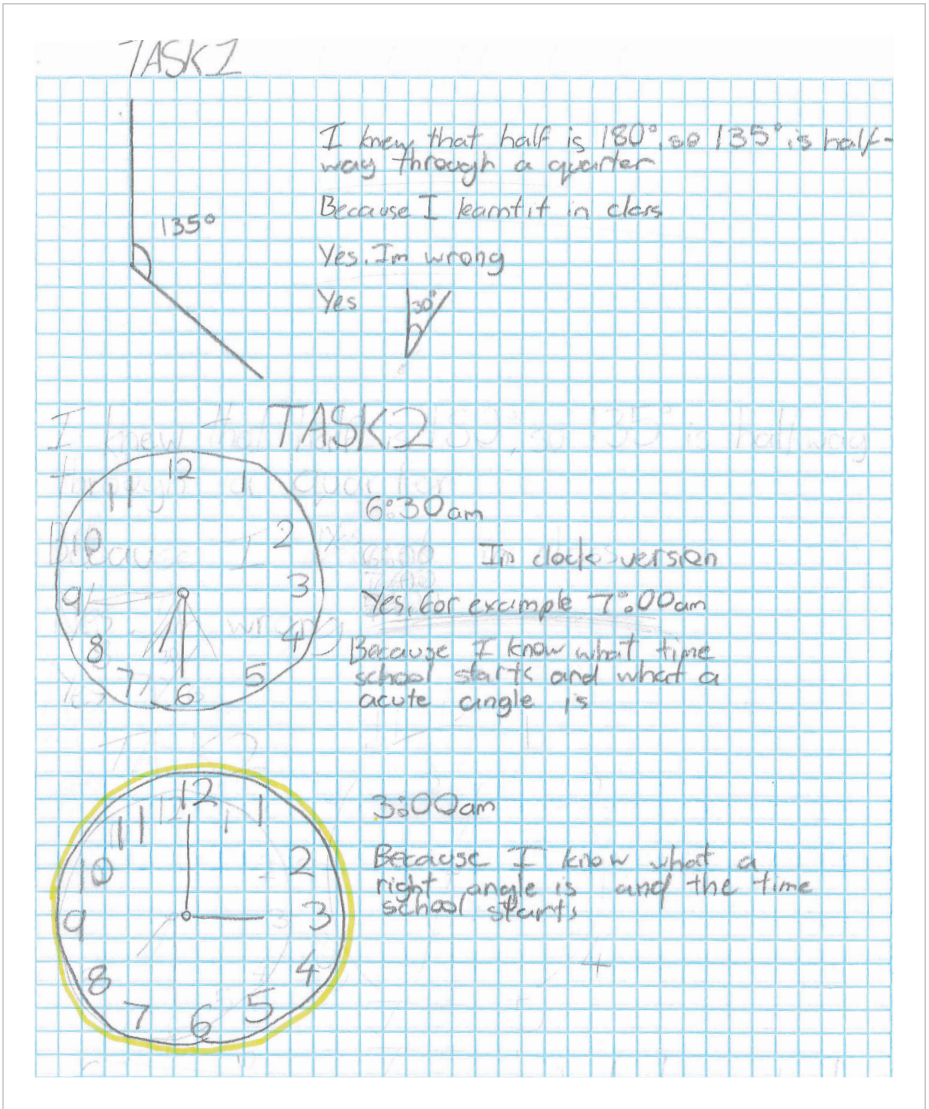
Geometry – My angle



Annotations

Estimates and constructs an angle.

Acknowledgement
ACARA acknowledges the contribution of Australian teachers and education authorities in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

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Year 5

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Measurement – Garden bed

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on fractions and decimals. They were asked to complete two tasks:

- *Divide a large rectangular garden bed into a number of equal plots. What addition and subtraction sentences can you create with fractions by looking at your garden?*
- *Tom created a number pattern which included the decimal 1.25. What could the pattern be?*

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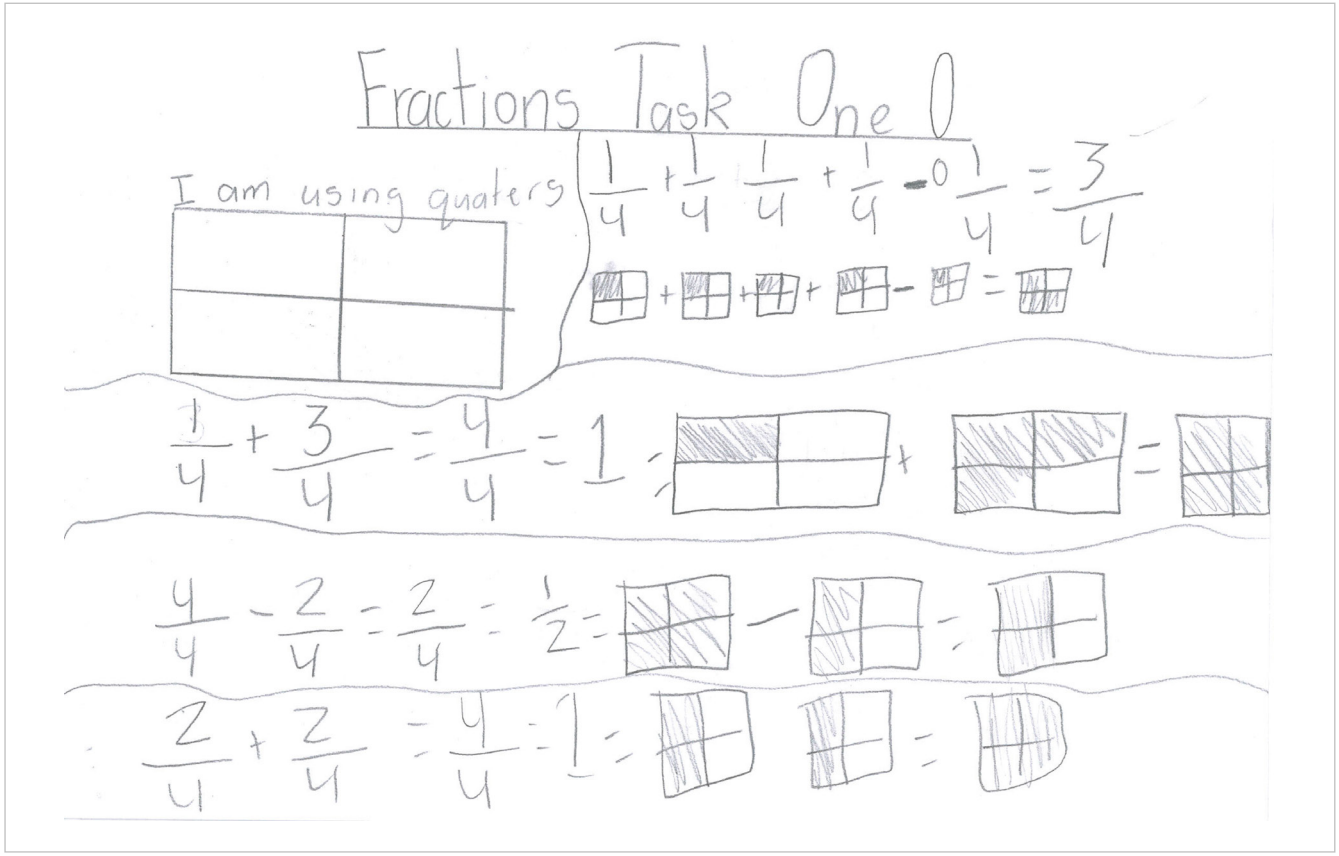
Measurement – Garden bed



Annotations

Divide a shape into one set of equal parts.

Calculates addition and subtraction of fractions with the same denominator.

Acknowledgement
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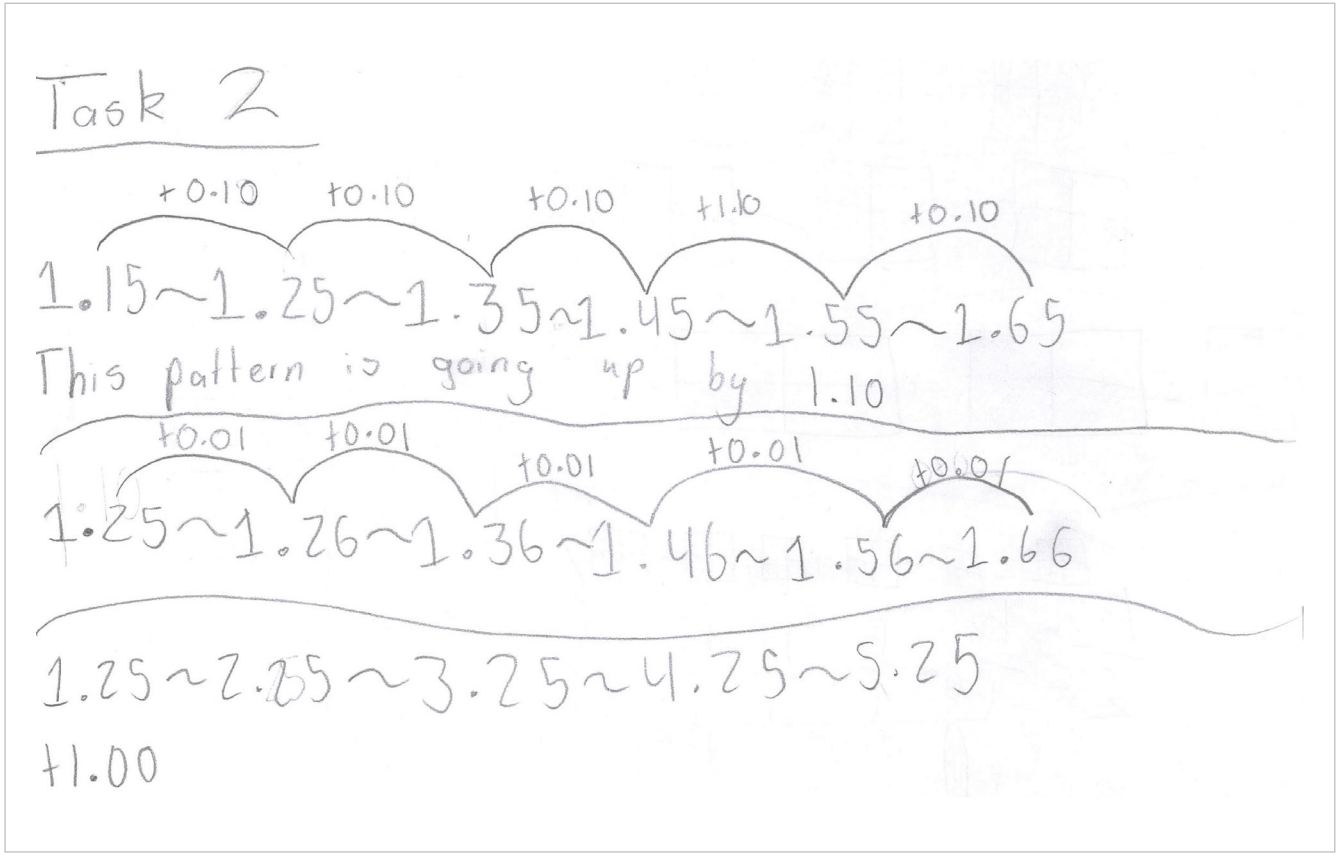
Measurement – Garden bed



Annotations

Creates and continues number patterns with tenths and whole numbers.

Acknowledgement
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Numbers – Treasure Hunt

Relevant parts of the achievement standard

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Summary of task

Students were given the following problem to solve after completing a unit of work on multiplication, division, factors and multiples:

- *Our teacher is planning a treasure hunt for teams of students in Year 5 and Year 6. There are 48 Year 5 students and 60 Year 6 students. Each team has to have equal numbers and team members are from the same year level.*
- *What are all the possible team sizes that can participate in the treasure hunt?*
- *What are the largest possible group sizes that our teacher can have?*

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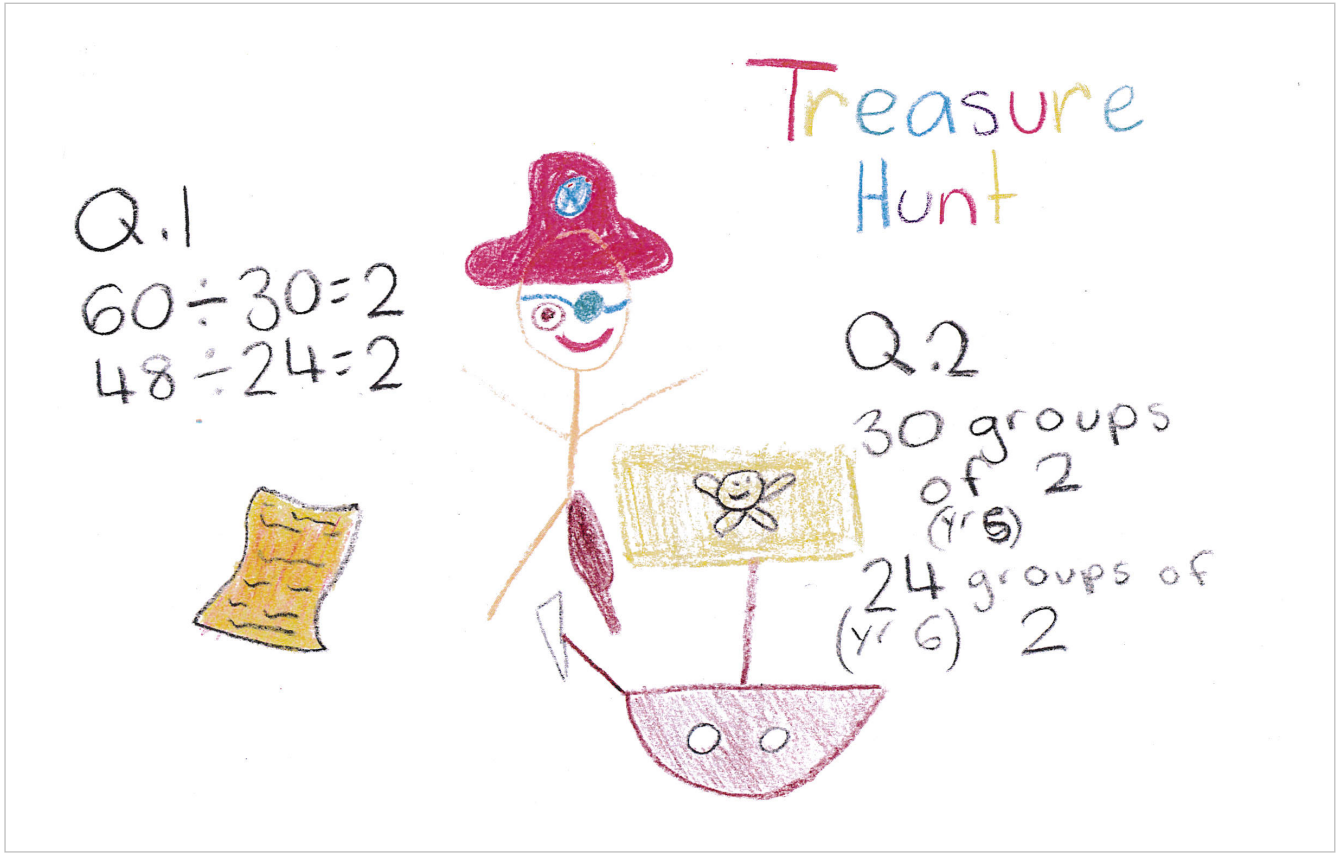
Numbers – Treasure Hunt



Annotations

Recognises multiplication as groups of the same size.

Acknowledgement
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Measurement – How many can you make?

Relevant parts of the achievement standard

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Summary of task

Students had studied three-dimensional objects and their two-dimensional relationships, including nets and features.

Students were given a bag with two-dimensional shapes and asked to make as many three-dimensional objects as they could. They completed the table recoding as much information as they could about the three-dimensional objects. Students were encouraged to use mathematical terms to describe the objects.

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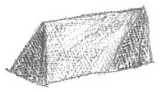
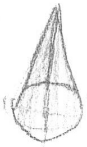
Measurement – How many can you make?

HOW MANY CAN YOU MAKE?

Using the ***2D shapes*** in the bag, make as many ***3D objects*** as you can. Once you have constructed your 3D object, using the table below record as much information as you can about the 3D object. Remember to name your objects and to use the correct language. You must work independently to complete this task.

Retangler Prism	Com	Retengel
A Retangler Prism has 4 Sied and 6 Pons 	A Com has 2 Sieds and won Pont. 	A Retengel has 8 Pont and has 6 Sieds

Annotations

Draws a prism and a cone and identifies some of the features.

Acknowledgement
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Number – Who are the fastest swimmers?

Relevant parts of the achievement standard

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Summary of task

Students had been studying a unit of work based on data from the Olympic Games. They had become familiar with ordering decimals on a number line, time in seconds, tenths of seconds and hundredths of seconds.

Students were given tables with information about the results of the Men's 100m Freestyle Semi-Finals from the London Olympic Games. They were asked to order the results from fastest to slowest. They then completed further ordering of decimals and located them on a number line. Students were also asked to think about what could be done in one hundredth of a second.

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Number – Who are the fastest swimmers?

Who Were the Fastest 100m Swimmers of 2012?

The tables below contain information from the Men's 100m Freestyle Semi-Finals from the 2012 London Olympic Games.

Task 1

Order the results from fastest to slowest performance, 1st-16th place.

Semi-Final 1

Lane	Athlete	Country	Time in Seconds	Placing
01	GILOT Fabien	France	48.49	10th
02	CIELO Cesar	Brazil	48.17	5th
03	FRASER Brett	Cayman islands	48.92	13th
04	LOUW Gideon	South Africa	48.44	9th
05	MAGNUSSEN James	Australia	47.63	1st
06	LOBINTSEV Nikita	Russia	48.38	8th
07	ROBERTS James	Australia	48.57	11th
08	FRASER Shaune	Cayman Islands	49.07	16th

Semi-Final 2

Lane	Athlete	Country	Time in seconds	Placing
01	AGNEL Yannick	France	48.23	7th
02	JONES Cullen	USA	48.60	13th
03	HAYDEN Brent	Canada	48.21	6th
04	ADRIAN Nathan	USA	47.97	2nd
05	VERSCHUREN Sebastiaan	Netherlands	48.13	4th
06	TIMMERS Pieter	Belgium	48.57	11th
07	CZERNIAK Konrad	Poland	48.44	9th
08	GARCIA Hanser	Cuba	48.04	3rd

Annotations

Orders decimals from lowest to highest.

Acknowledgement

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Measurement – Using time

Relevant parts of the achievement standard

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Summary of task

Students had spent a week focusing on comparing and representing 12 and 24 hour time.

They were asked to create a timeline of a typical day in their lives in 12 and 24 hour time and record their day using both digital and analogue time. They completed this task in a half hour time slot.

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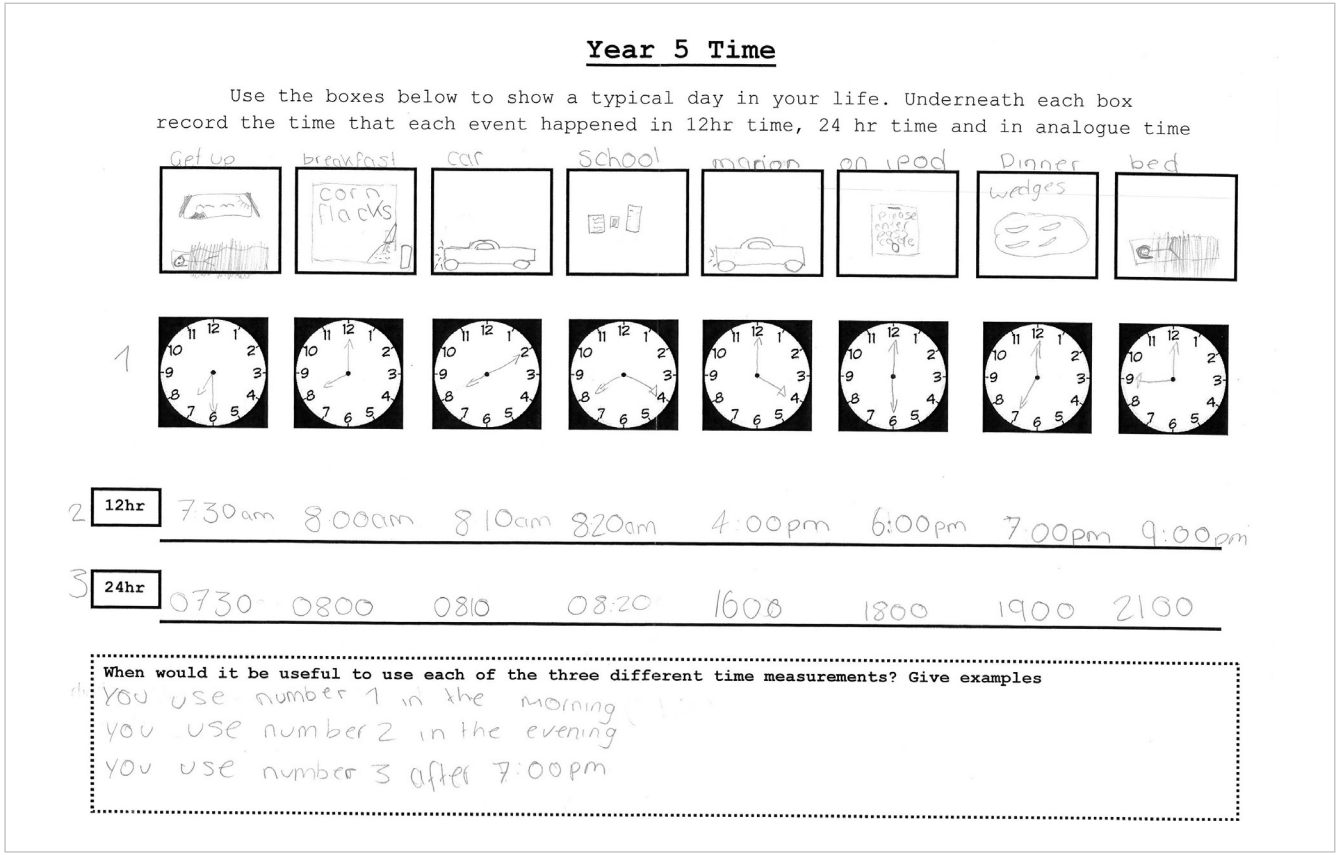
Measurement – Using time



Year 5 Time

Use the boxes below to show a typical day in your life. Underneath each box record the time that each event happened in 12hr time, 24 hr time and in analogue time

Get up | breakfast | car | School | marion | on ipod | Dinner | bed

corn flacks | wedges

1

2 12hr 7:30am 8:00am 8:10am 8:20am 4:00pm 6:00pm 7:00pm 9:00pm

3 24hr 0730 0800 0810 08:20 1600 1800 1900 2100

When would it be useful to use each of the three different time measurements? Give examples

You use number 1 in the morning
you use number 2 in the evening
you use number 3 after 7:00pm

Annotations

Records times in analogue, digital and 24 hour time.

Acknowledgement
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Measurement – Using perimeter and area

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on perimeter and area. They had been given opportunities to practise measuring objects using millimetres, centimetres, metres and calculate area using cm^2 and m^2.

Students were asked to define area and perimeter and explain how each is calculated. They were then asked to choose shapes to measure and to calculate the perimeter and area of each. They were also asked to identify what units should be used to measure the length of items.

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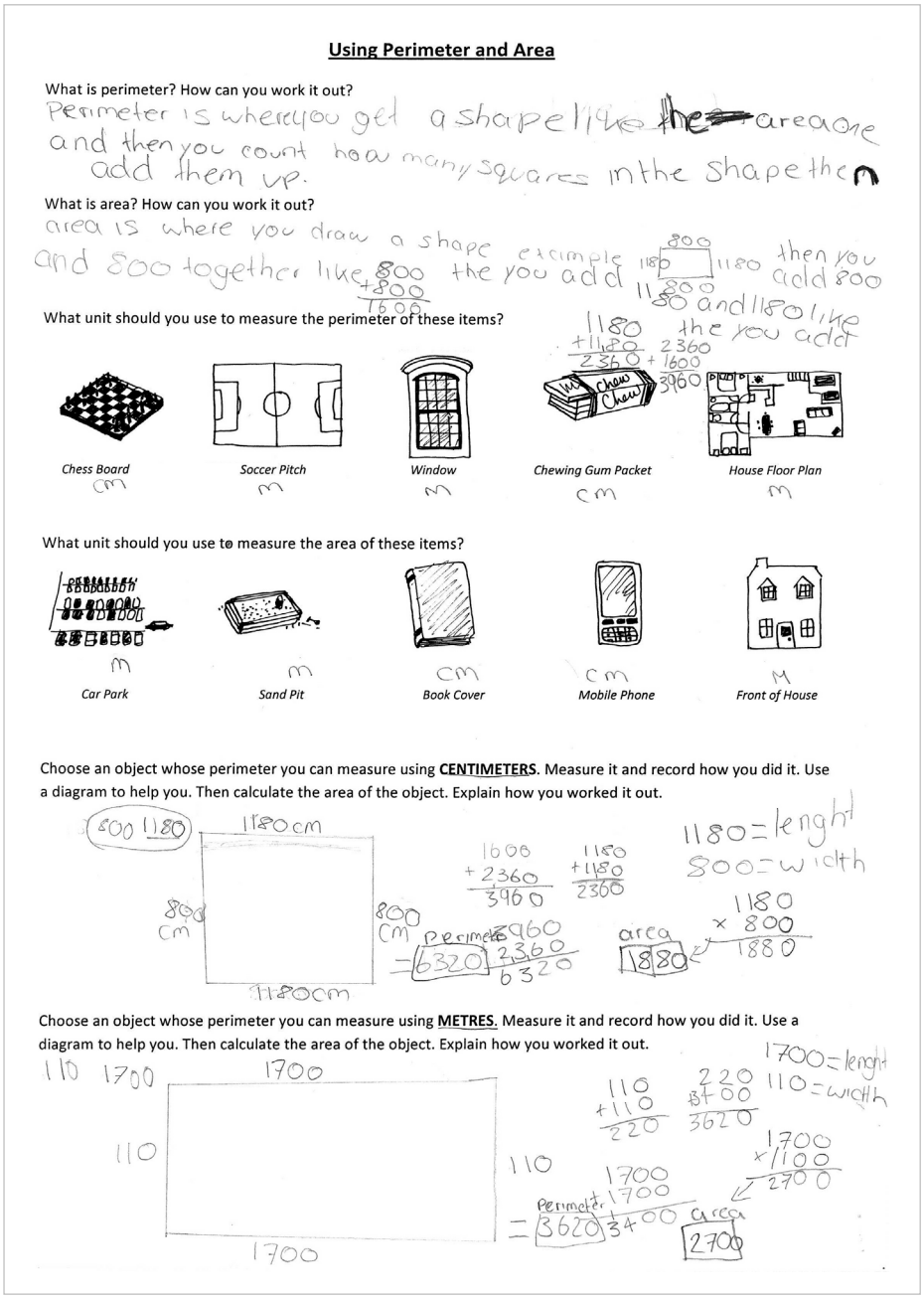
Measurement – Using perimeter and area



Using Perimeter and Area

What is perimeter? How can you work it out?

Perimeter is where you get a shape like the area one and then you count how many squares in the shape then add them up.

What is area? How can you work it out?

area is where you draw a shape example and 800 together like 800 + 800 = 1600 the you add 800 1180 1180 then you add 800 1180 and 1180 like the you add 1180 + 1180 = 2360 2360 + 1600 = 3960

What unit should you use to measure the perimeter of these items?

Chess Board cm
Soccer Pitch m
Window m
Chewing Gum Packet cm
House Floor Plan m

What unit should you use to measure the area of these items?

Car Park m
Sand Pit m
Book Cover cm
Mobile Phone cm
Front of House M

Choose an object whose perimeter you can measure using **CENTIMETERS**. Measure it and record how you did it. Use a diagram to help you. Then calculate the area of the object. Explain how you worked it out.

800 1180 1180 cm 800 cm 800 cm 1180 cm

1600 + 2360 = 3960 1180 + 1180 = 2360

1180 = lenght
800 = width

1180 × 800 = 1880

Perimeter = 6320 2360 + 2360 = 6320 area 1880

Choose an object whose perimeter you can measure using **METRES**. Measure it and record how you did it. Use a diagram to help you. Then calculate the area of the object. Explain how you worked it out.

110 1700 1700 110 110 1700

110 + 110 = 220 220 + 3400 = 3620

1700 = lenght
110 = width

1700 × 1100 = 2700

Perimeter = 3620 1700 + 1700 = 3400 area 2700

Annotations

Selects appropriate formal units to measure objects.

Demonstrates and understanding of area and perimeter but confuses the rules when calculating.

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Geometry – Location and transformation

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work about line and rotational symmetry, translation, rotation, reflection and the enlargement transformation of two-dimensional shapes.

Students were asked to draw two-dimensional shapes and follow the language of position to transform, enlarge and record the lines of symmetry in the shapes. They were then asked to enlarge a two-dimensional shape using grid paper.

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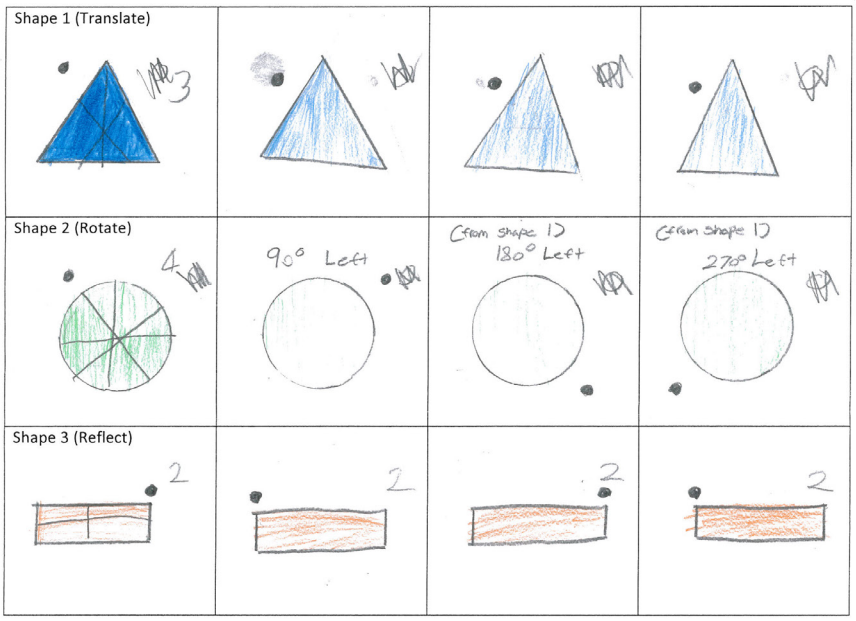
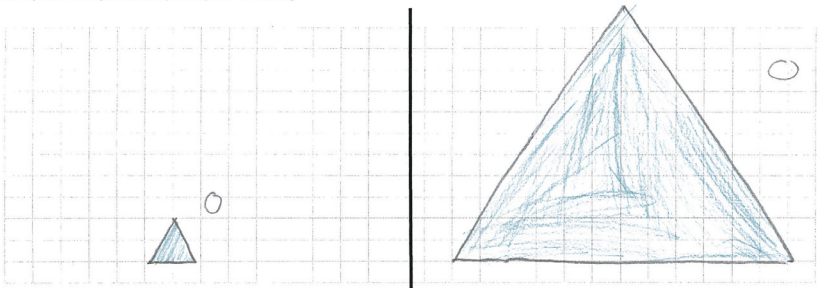
Geometry – Location and transformation

Location & Transformation – Year 5

- Draw three different 2 dimensional shapes in the first column.
- In the first row, show how the shape can be translated in different ways. Describe what you did.
- In the second row, show how the shape can be rotated in different ways. Describe what you did.
- In the third row, show how the shape can be reflected. Describe what you did.
- Show how many lines of symmetry each shape has.



On the left side of the grid draw a simple picture. Enlarge the same picture on the right side of the grid. By how much have you enlarged it? Explain your thinking.



Annotations

Demonstrates that shape remains the same under translation.

Understands that rotating changes position but not shape.

Recognises that enlargement increases the size of the object.

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Number – Number sentences

Relevant parts of the achievement standard

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Summary of task

Students had completed class tasks involving number sentences and unknown quantities.

Students were asked to complete a task to describe numbers in a number sentence in a variety of ways. This task was completed under timed conditions.

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Number – Number sentences

Number Sentences

Instructions!

- Choose 15 different numbers between 0 and 100
- Express each number in two different ways using mixed operations

	Number	First way	Second way
	Eg. 3	3= 6 x 4 – 3 x 7	3 = 56÷7÷2 - 1
1.	5	5 = 2+3	5 = 10-5
2	10	10 = 5 x 2	10 = 5+5
3	12	12 = 3x4	12 = 10+2
4	15	15 = 20-10	15 = 10+5
5	20	20 = 2x10	20 = 10+10
6	25	25 = 20+5	25 = 30-5
7	30	30 = 20+10	30 = 25+5
8	36	36 = 40-4	36 = 30+6
9	40	40 = 2x20	40 = 80 ÷ 2
10	50	50 = 100÷2	50 = 10+40
11	60	60 = 30+30	60 = 100-40
12	70	70 = 100-30	70 = 2x30
13	80	80 = 2x40	80 = 40+40
14	90	90 = 100-10	90 = 45+45
15	100	100 = 10x10	100 = 50+50

Annotations

Performs operations in the correct order.

Uses one operation to make the number.

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Geometry – Mapping

Relevant parts of the achievement standard

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Summary of task

Students have studied maps and used a compass.

Students were asked to draw a treasure island map, to create a scale and compass rose, and to impose a grid and coordinates. They were required to write a set of directions, using compass points or grid coordinates, to the location of a hidden treasure on their map. Students exchanged maps and followed the directions to find the treasure. They were encouraged to comment on the scale used.

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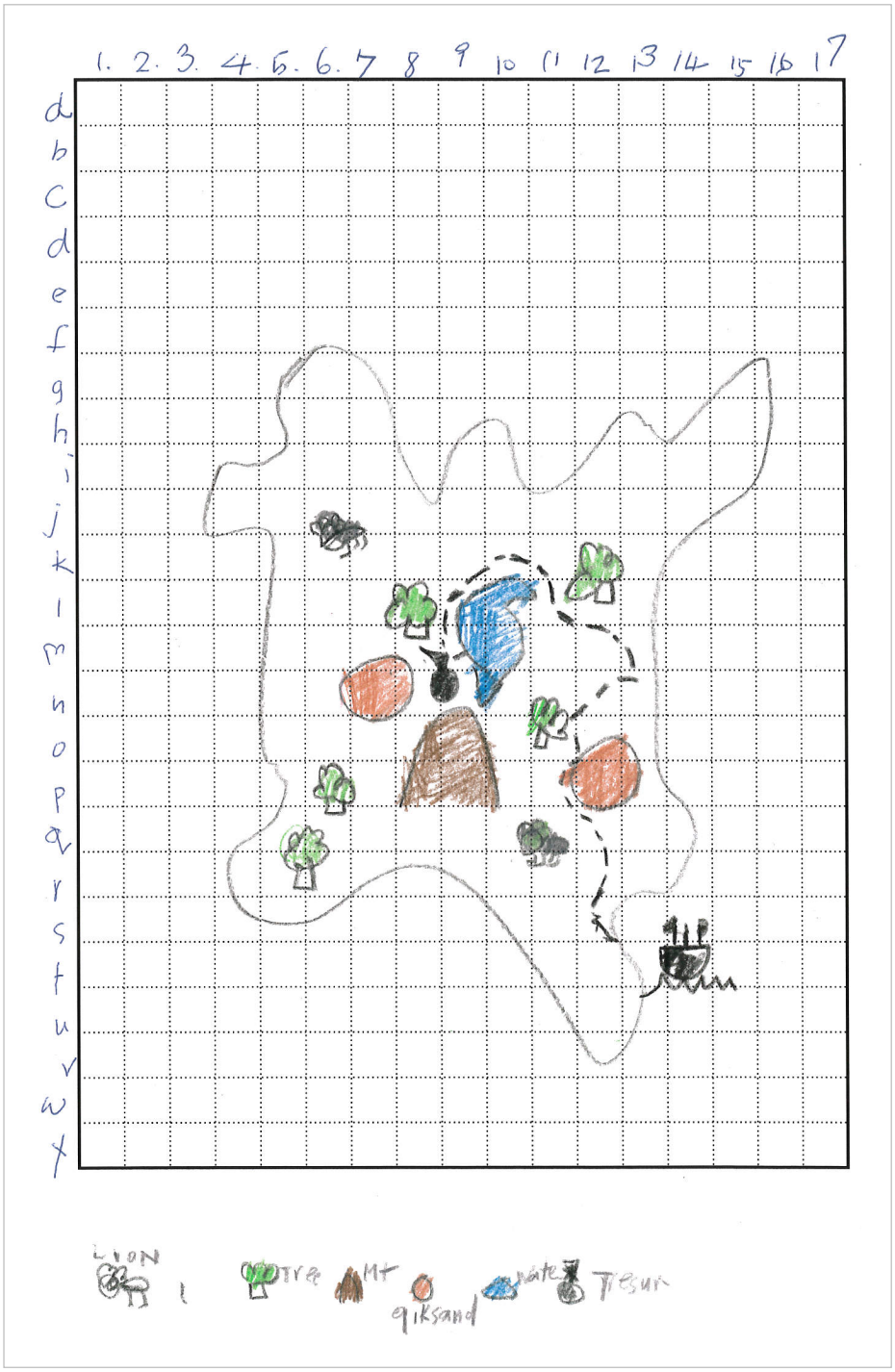
Below Satisfactory

Geometry – Mapping



Annotations

Identifies landmarks on the map.

Acknowledgement

ACARA acknowledges the contribution of Australian teachers and education authorities in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Year 5

Below Satisfactory

Statistics and Probability – Come in spinner

Relevant parts of the achievement standard

By the end of Year 5, students solve simple problems involving the four operations using a range of strategies. They check the reasonableness of answers using estimation and rounding. Students identify and describe factors and multiples. They explain plans for simple budgets. Students connect three-dimensional objects with their two-dimensional representations. They describe transformations of two-dimensional shapes and identify line and rotational symmetry. Students compare and interpret different data sets.

Students order decimals and unit fractions and locate them on number lines. They add and subtract fractions with the same denominator. Students continue patterns by adding and subtracting fractions and decimals. They find unknown quantities in number sentences. They use appropriate units of measurement for length, area, volume, capacity and mass, and calculate perimeter and area of rectangles. They convert between 12 and 24 hour time. Students use a grid reference system to locate landmarks. They measure and construct different angles. Students list outcomes of chance experiments with equally likely outcomes and assign probabilities between 0 and 1. Students pose questions to gather data, and construct data displays appropriate for the data.

Summary of task

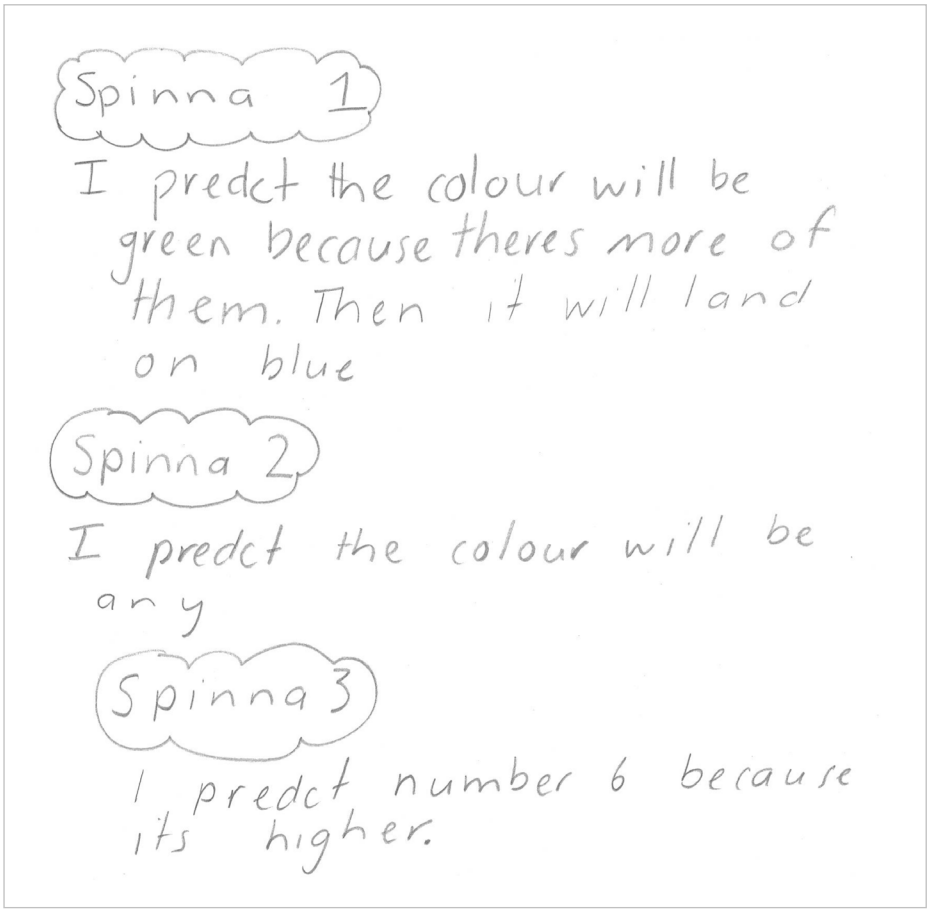
This task was the culmination of a series of activities dealing initially with the language of chance and then conducting simple chance experiments. The students had discussed fair and unfair spinners and the numerical chance of a particular result happening.

Students were required to make 3 spinners. One of the spinners had 4 colours but there was not an equal chance of spinning each colour. The second spinner had 6 numbers on it with an equal chance of spinning each number and the third spinner had 6 numbers on it with an unequal chance of spinning each of the numbers. Students were required to pose questions, predict the chance of the outcomes and then conduct the task. Students were asked to record all answers in tables and graphs. After completing the task students compared their results to other class members and interpreted the results.

Mathematics

Year 5
Below Satisfactory

Statistics and Probability – Come in spinner



Annotations

Makes some predictions about the possible results of the experiments in relation to specific spinners.

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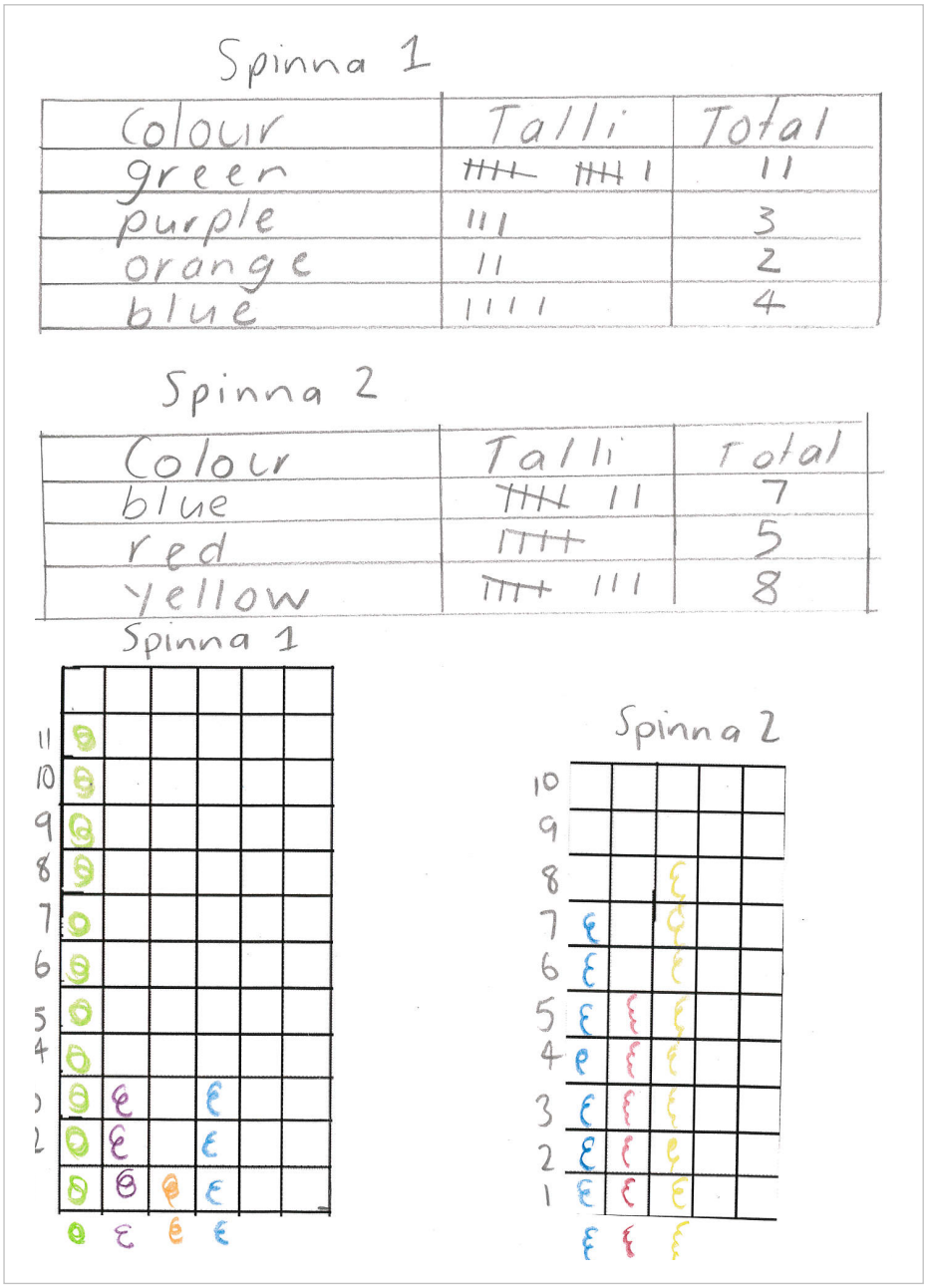
Mathematics

Year 5

Below Satisfactory

Statistics and Probability – Come in spinner



Spinna 1

Colour	Talli	Total
green	𝍸 𝍸 I	11
purple	III	3
orange	II	2
blue	IIII	4

Spinna 2

Colour	Talli	Total
blue	𝍸 II	7
red	𝍸	5
yellow	𝍸 III	8

Annotations

Records the results of the experiment using tally marks and totals.

Acknowledgement
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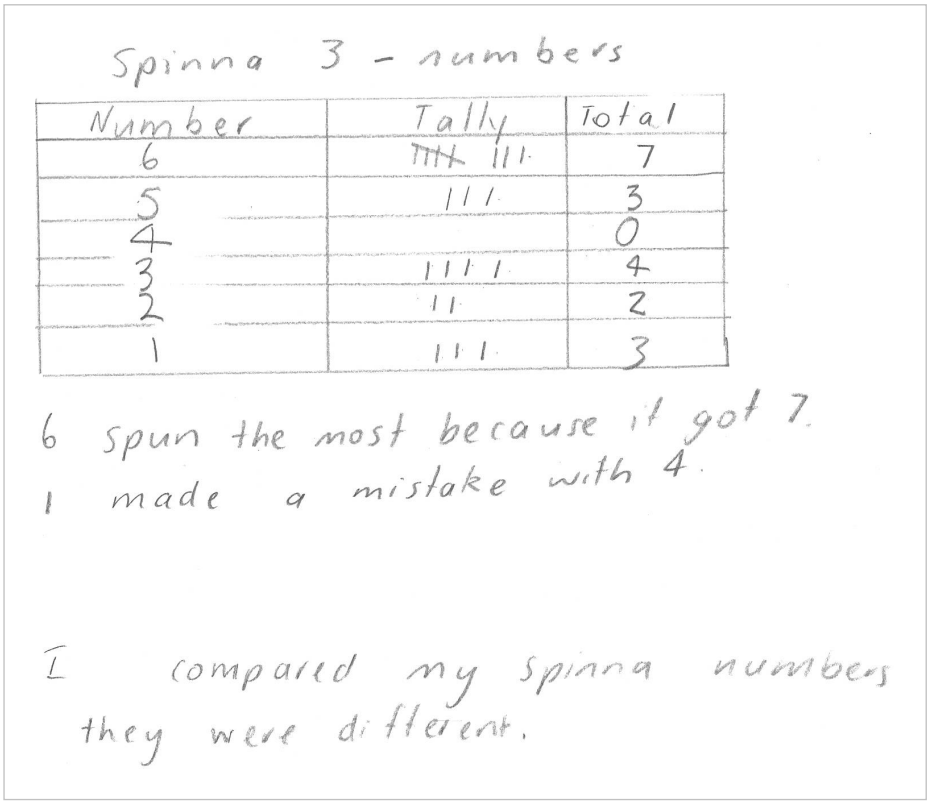
Mathematics

Year 5
Below Satisfactory

Statistics and Probability – Come in spinner



Spinna 3 – numbers

Number	Tally	Total
6	𝍸 | | |	7
5	| | |	3
4		0
3	| | | |	4
2	| |	2
1	| | |	3

6 spun the most because it got 7.
I made a mistake with 4.

I compared my spinna numbers they were different.

Annotations

Reflects on results.

Acknowledgement
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