Mathematics

Year 4
Above 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 4 Mathematics

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

Sample 1	Number – Lucy's birthday
Sample 2	Number – Multiplication
Sample 3	Geometry – Quadrilaterals
Sample 4	Number – Odd and even
Sample 5	Number – Bingo
Sample 6	Geometry – Symmetry
Sample 7	Number – Sentences
Sample 8	Number – Fractions and decimals
Sample 9	Measurement – Angles

This portfolio of student work shows the drawing of different quadrilaterals with the same area (WS3) and the student applying strategies to solve problems using knowledge of patterning, odd and even numbers and multiplication and division facts up to 10 x 10 (WS1, WS2, WS5). The student added consecutive numbers to demonstrate understanding of odd and even numbers (WS4). The student creates four sided shapes with and without symmetry (WS6) and identified angles found in the environment (WS9). The student constructed addition and subtraction number sentences to solve written problems (WS7) and identified equivalent fractions and decimals, located them on a number line and represented them pictorially (WS8).

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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 aspects of the achievement standard are not evident in this portfolio:

- *interpret information contained in maps*
- *describe different methods for data collection*
- *identify dependent and independent events*
- *list the probabilities of everyday events*
- *solve simple purchasing problems*
- *solve problems involving time duration*
- *describe different methods for data collection and representation, and evaluate their effectiveness*
- *convert between units of time*
- *construct data displays from given or collected data.*

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Number – Lucy's birthday

Relevant parts of the achievement standard

By the end of Year 4, students choose appropriate strategies for calculations involving multiplication and division. They recognise common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. Students solve simple purchasing problems. They identify unknown quantities in number sentences. They describe number patterns resulting from multiplication. Students compare areas of regular and irregular shapes using informal units. They solve problems involving time duration. They interpret information contained in maps. Students identify dependent and independent events. They describe different methods for data collection and representation, and evaluate their effectiveness.

Students use the properties of odd and even numbers. They recall multiplication facts to 10 x 10 and related division facts. Students locate familiar fractions on a number line. They continue number sequences involving multiples of single digit numbers. Students use scaled instruments to measure temperatures, lengths, shapes and objects. They convert between units of time. Students create symmetrical shapes and patterns. They classify angles in relation to a right angle. Students list the probabilities of everyday events. They construct data displays from given or collected data.

Summary of task

Students had been working with patterns and number sequences. Students were given this task to complete in a half hour time period in class:

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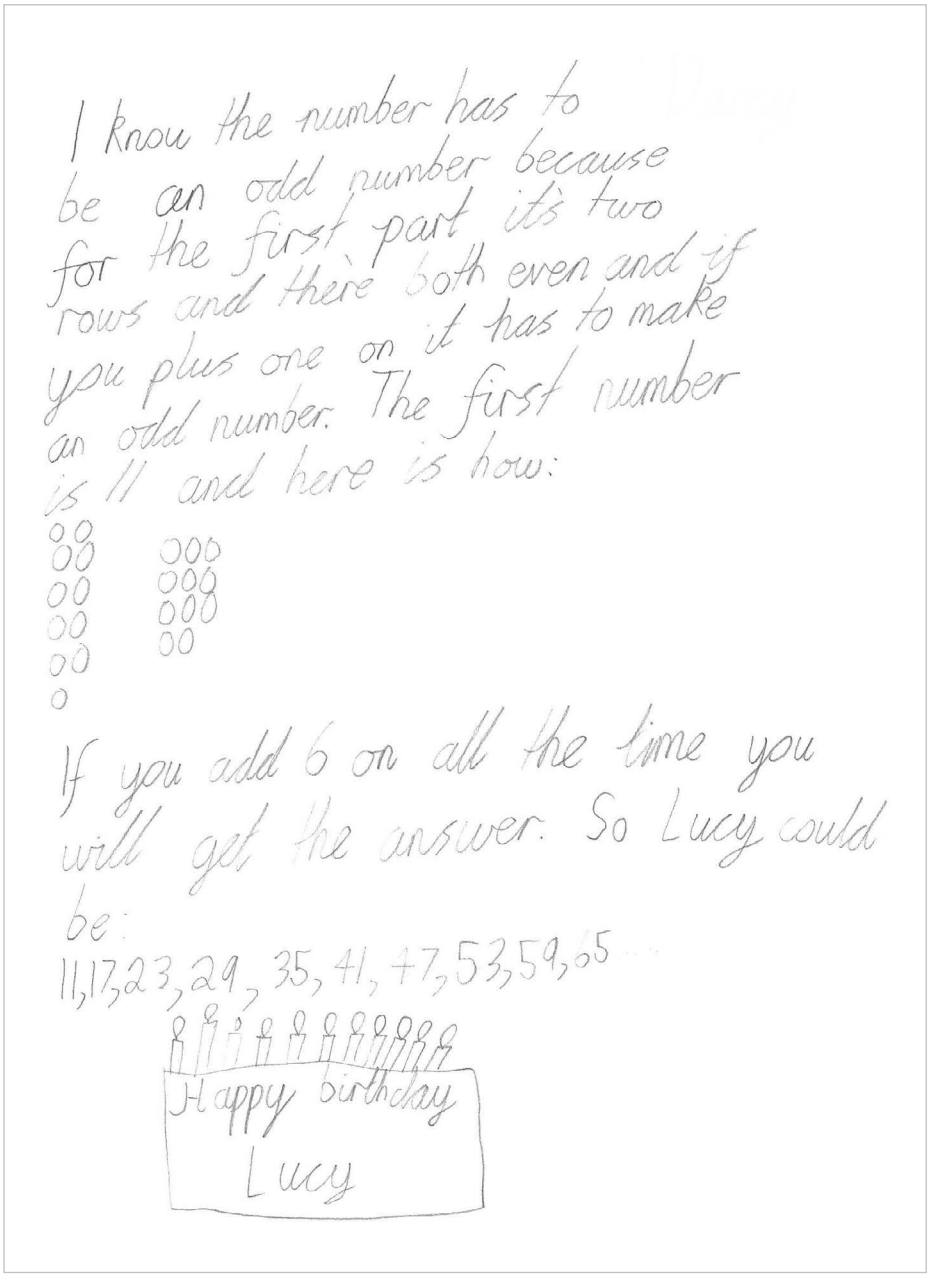
Number – Lucy's birthday



Annotations

Communicates a logical approach to finding the answer to the number sentence problem.

Communicates a clear written answer to the problem.

Generalises the result to give all possible answers to the problem.

Acknowledgement
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Number – Multiplication

Relevant parts of the achievement standard

By the end of Year 4, students choose appropriate strategies for calculations involving multiplication and division. They recognise common equivalent fractions in familiar contexts and make connections between fraction and decimal notations up to two decimal places. Students solve simple purchasing problems. They identify unknown quantities in number sentences. They describe number patterns resulting from multiplication. Students compare areas of regular and irregular shapes using informal units. They solve problems involving time duration. They interpret information contained in maps. Students identify dependent and independent events. They describe different methods for data collection and representation, and evaluate their effectiveness.

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Summary of task

Students had been working with patterns formed when looking at number sequences involving multiplication. Students were given this task to complete in a half hour time period in class.

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Number – Multiplication

Can you create a multiplication number pattern that includes the number 60?

6, 12, 18, 24, 30, 36, 42, 48, 54, 60

The rule of My Pattern is x6

The 20th term in my pattern is 120 because The six timestables are all even

Larger numbers in the 6 timestables 6000 Because 60 is the 10th term in the 6 times table and you know

These numbers are not in 6x table because they are odd: 7323, 171173, 3731

I am going to look at some numbers and check if they are in the 6 times tables.

1332 it is the 222 term — $6\overline{)1332}^{222}$ 1332 is in the 6 times table

1322 because it has a remader when you divide by 6 — $6\overline{)1322}^{220}$ r2 1322 is not in the 6 timeStable

Annotations

Demonstrates a multiplication number pattern that includes 60.

Finds the 20th term in the sequence.

States numbers that would be included in the multiplication number pattern and those that wold not be included with some justification.

Demonstrates if a term is in the sequence or not and which term it would be in the sequence.

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Geometry – Quadrilaterals

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on two dimensional shapes, their properties and their area.

Students were asked to draw quadrilaterals with the same area as the given diagram.

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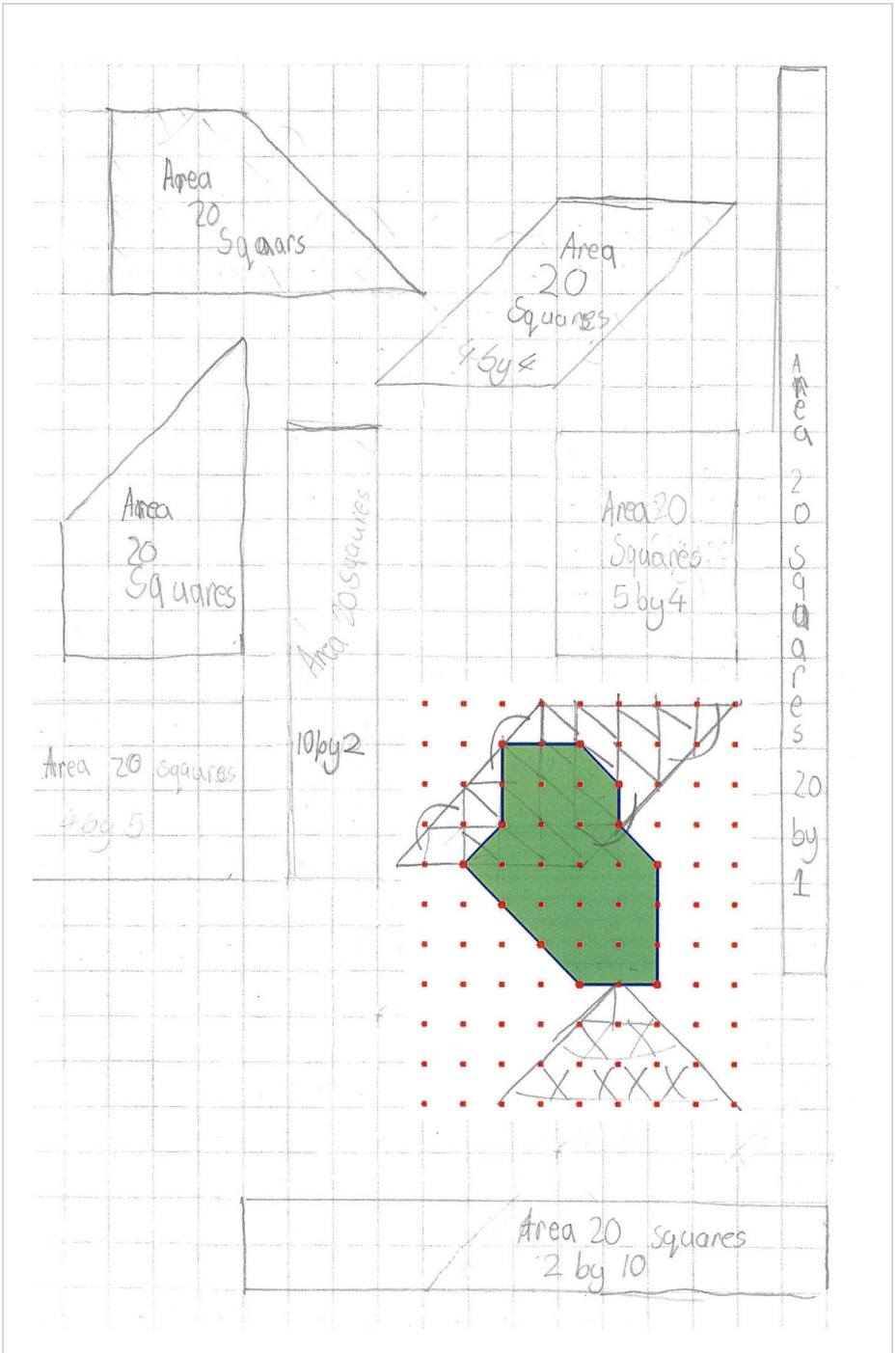
Geometry – Quadrilaterals



Annotations

Determines the area of the irregular shape.

Draws a parallelogram which has an area the same as the irregular shape.

Draws a trapezium which has an area the same as the irregular shape.

Draws all rectangles that give the same area as the irregular shape.

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Number – Odd and even

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on addition and subtraction of numbers investigating combinations of odd and even numbers.

Students were given one lesson to complete this task.

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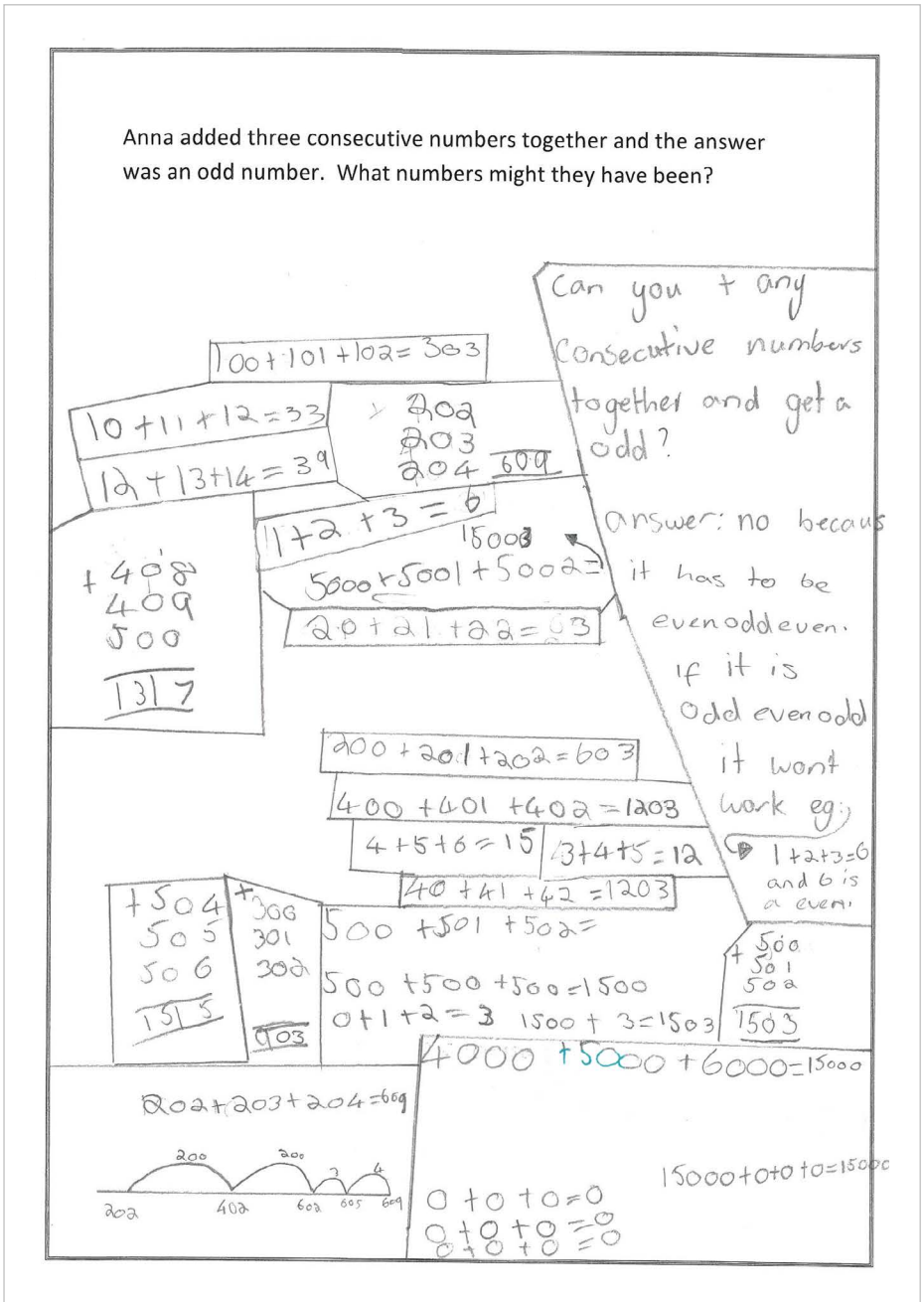
Number – Odd and even



Annotations

Demonstrates an understanding of the meaning of consecutive numbers and adds a variety of three consecutive numbers.

Draws conclusions based on their calculations.

Generalises the result and demonstrates where it does not work.

Shows the addition of three four digit numbers.

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Number – Bingo

Relevant parts of the achievement standard

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Summary of task

Students had been practising their multiplication facts. Students were given this task to complete in a half hour time period in class.

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Number – Bingo

Bingo Assessment Task

Design your own 4x4 grid in order to maximise your chances of achieving a bingo – 4 numbers in a row – diagonally, horizontally, vertically or the four corners. The aim of the game is to achieve a bingo in as few moves (multiplication facts) as possible.

8	10	24	20
6	16	4	9
36	48	32	21
40	12	28	30

Select 4 numbers from your grid and explain why you included them.

I included 30, 20, 40 and 10 because you can make them in four different ways each. So I have a 4 out of 100 chance of getting the number.

Choose 2 numbers you didn't include on your grid and write why you didn't choose them.

I didn't include 1 and 100 because you can only make them in one way each. So I only have a 1 out of 100 chance of getting the number.

Annotations

Identifies common products of multiplication facts.

Justifies choice of more common products and describes the number of ways they can be created using multiplication facts.

Describes a chance outcome using mathematical language.

Justifies choice of less common products and describes the number of ways they can be created using multiplication facts.

Describes a chance outcome using mathematical language.

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Geometry – Symmetry

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on two dimensional shapes and their properties including symmetry.

Students were asked to draw shapes with more than four sides that had at least one line of symmetry and to create quadrilaterals that didn't have any lines of symmetry.

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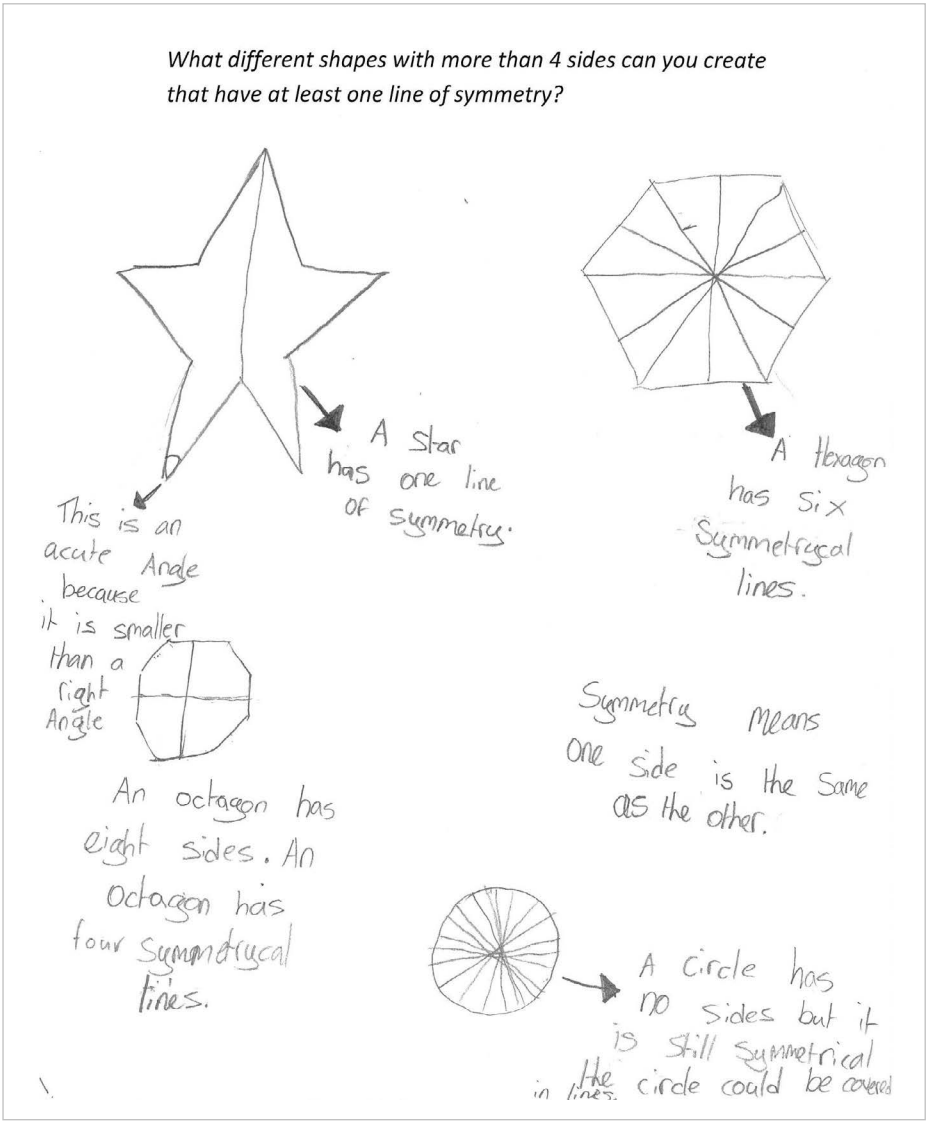
Geometry – Symmetry



Annotations

Draws symmetrical shapes.

Identifies the lines of symmetry in a shape.

Identifies the number of lines of symmetry.

Identifies and describes the types of angles in a shape.

Defines symmetry.

Describes that a circle is symmetrical and has infinite lines of symmetry.

Acknowledgement
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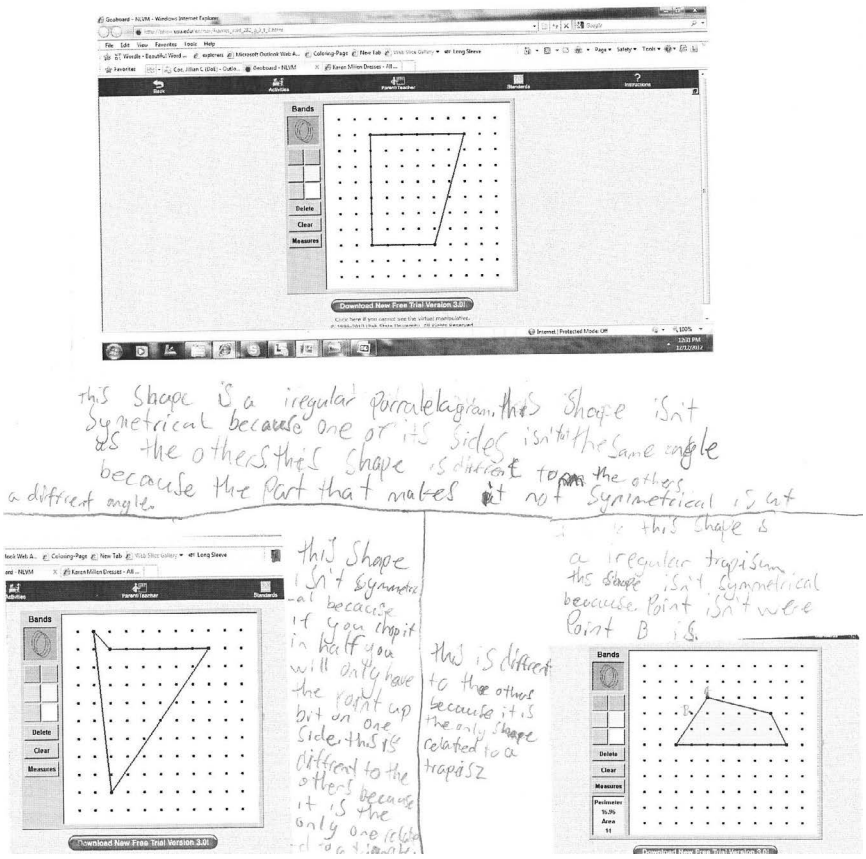
Geometry – Symmetry

TASK 2

What different quadrilaterals can you create on a virtual geoboard that have NO lines of symmetry?



Annotations

Creates asymmetrical shapes.

Labels irregular shapes.

Explains the features of asymmetrical shapes.

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Number – Sentences

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on addition, subtraction and identification of unknown quantities in number sentences.

Students were asked to complete a series of problems showing their visual representations to solve the problem and a number sentence with an answer.

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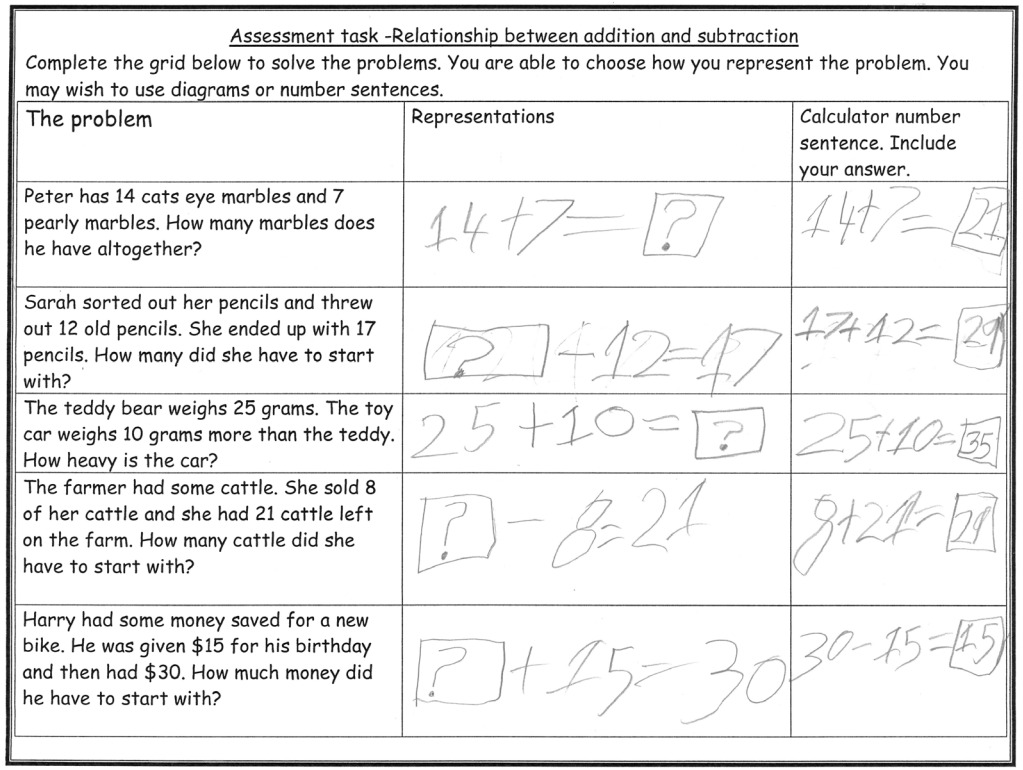
Number – Sentences



Assessment task -Relationship between addition and subtraction

Complete the grid below to solve the problems. You are able to choose how you represent the problem. You may wish to use diagrams or number sentences.

The problem	Representations	Calculator number sentence. Include your answer.
Peter has 14 cats eye marbles and 7 pearly marbles. How many marbles does he have altogether?	14 + 7 = ?	14 + 7 = 21
Sarah sorted out her pencils and threw out 12 old pencils. She ended up with 17 pencils. How many did she have to start with?	? + 12 = 17	17 + 12 = 29
The teddy bear weighs 25 grams. The toy car weighs 10 grams more than the teddy. How heavy is the car?	25 + 10 = ?	25 + 10 = 35
The farmer had some cattle. She sold 8 of her cattle and she had 21 cattle left on the farm. How many cattle did she have to start with?	? − 8 = 21	8 + 21 = 29
Harry had some money saved for a new bike. He was given $15 for his birthday and then had $30. How much money did he have to start with?	? + 15 = 30	30 − 15 = 15

Annotations

Creates a number sentence using a question mark as the unknown quantity.

Uses addition to solve a subtraction algorithm.

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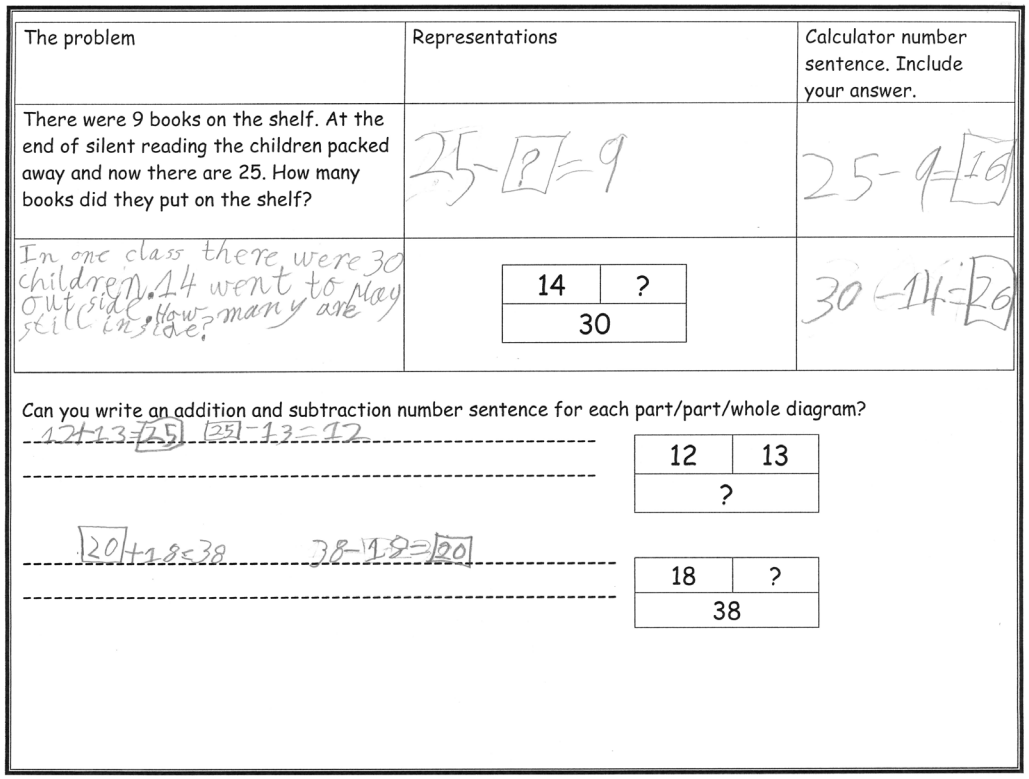
Number – Sentences



The problem	Representations	Calculator number sentence. Include your answer.
There were 9 books on the shelf. At the end of silent reading the children packed away and now there are 25. How many books did they put on the shelf?	25-[9]=9	25-9=[16]
In one class there were 30 children. 14 went to play outside. How many are still inside?	14 | ? 30	30-14=[16]

Can you write an addition and subtraction number sentence for each part/part/whole diagram?

12+13=[25] [25]-13=12

12	13
?	

[20]+18=38 38-18=[20]

18	?
38	

Annotations

Writes a problem to match a number sentence with an unknown quantity.

Connects addition and subtraction to solve a number sentence.

Acknowledgement
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Number – Fractions and decimals

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on fractions looking at haves, quarters thirds, sixths, fifths, eighths and tenths both of collections and a whole.

Students were asked to choose two fractions that are equivalent and fill in the appropriate information on a think board. They also had to cut a length of string and create a blank number line, marking their fractions and decimals on it.

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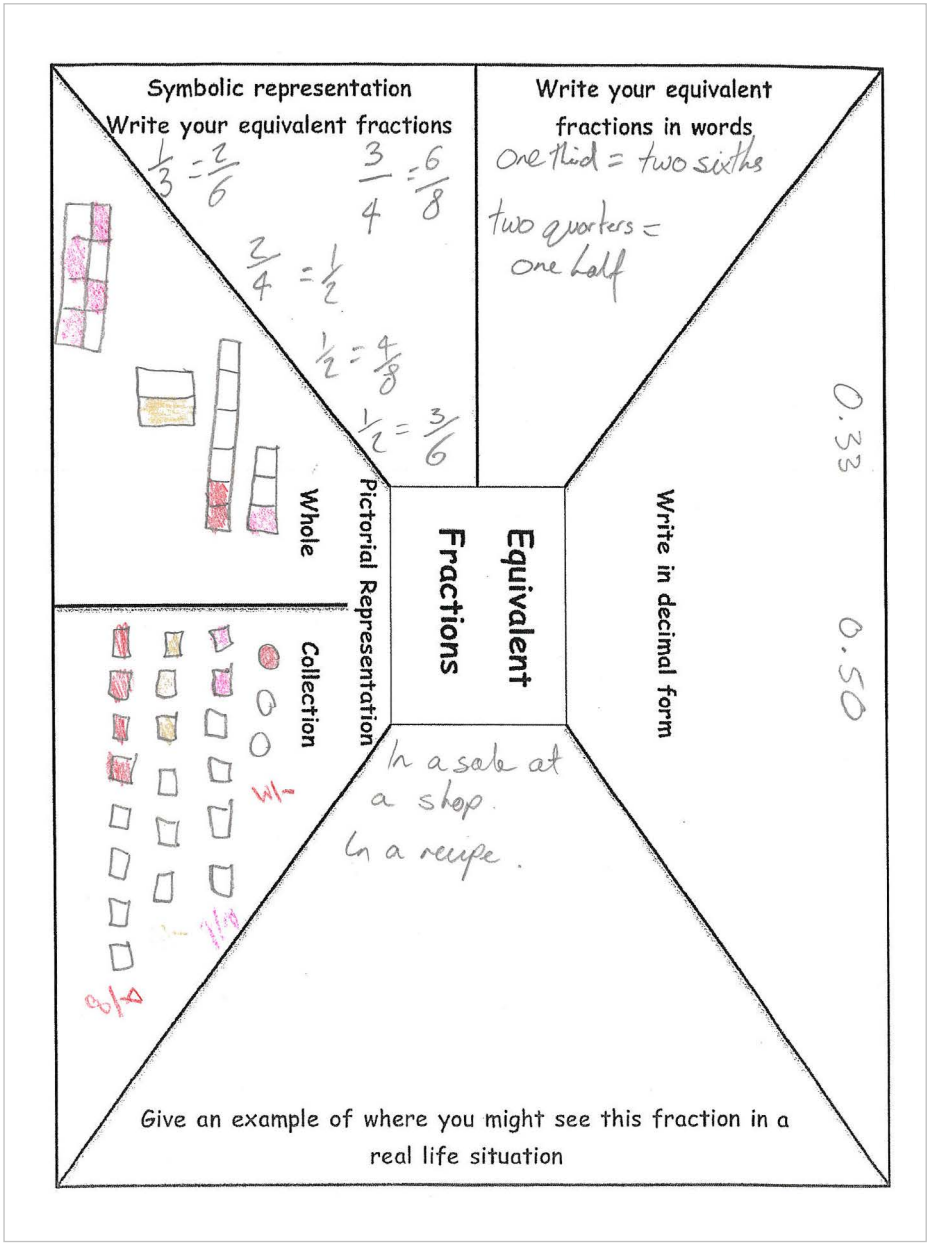
Number – Fractions and decimals



Annotations

Writes equivalent fractions in words.

States many equivalent fractions.

Writes the fraction in the decimal form.

Represents fractions as parts of a whole.

Represents fractions as parts of a collection.

Indicates where fractions can be found in every day life.

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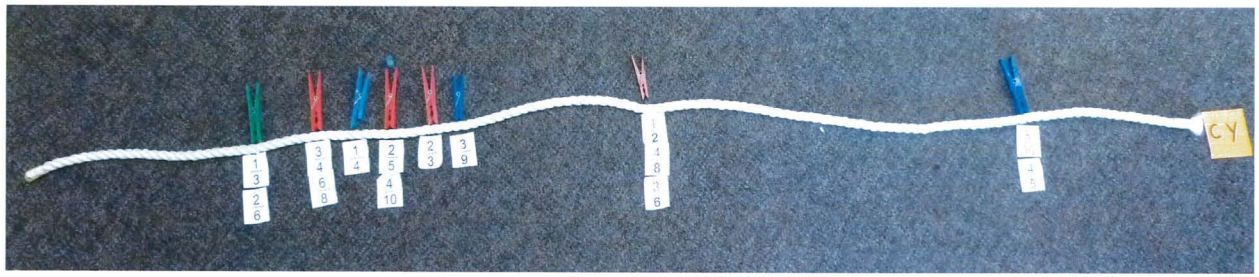

Annotations

Locates equivalent fractions and decimals on a number line.

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Measurement – Angles

Relevant parts of the achievement standard

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Summary of task

Students had completed a ten lesson integrated unit of work on The Olympics and angles.

Students were asked to create report for a TV show explaining angles in the environment. Students were given two lessons to complete the task.

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Measurement – Angles

Annotations

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