

# Mathematics

# Year 3

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 3 Mathematics

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

Sample 1	Number – Lunch order
Sample 2	Number – All about a fraction
Sample 3	Measurement – How much is there?
Sample 4	Geometry – What is on my island?
Sample 5	Number – Neighbourly numbers
Sample 6	Geometry – Symmetry
Sample 7	Geometry – Smaller than a square
Sample 8	Statistics – Ice-cream flavours
Sample 9	Number – Apple Orchard
Sample 10	Algebra – 20 Charlie
Sample 11	Measurement – Time

This portfolio of student work demonstrates addition and subtraction computation strategies (WS1) and the classification of odd and even numbers (WS5). The student identifies and creates number patterns (WS5, WS10) and models unit fractions (WS2). The student measures capacities (WS3), draws maps and locates features (WS4). The student identified symmetry and angles in their environment (WS 6, WS7) and creates tables and graphs from given information (WS8). The student solves problems using multiplication and addition (WS9) and creates a presentation to teach others how to tell the time to the minute (WS11).

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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:

- *count to and from 10,000*
- *use metric for length and mass*
- *conduct chance experiments and list possible outcomes*
- *correctly counts out change from financial transactions and represents money values in various ways.*

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## Number – Lunch order

### Relevant parts of the achievement standard

*By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.*

*Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.*

### Summary of task

Students had completed a unit of work focusing on addition and subtraction computation strategies.


Students were asked to create a lunch order with a total cost of \$5.00 demonstrating addition and subtraction computation strategies. The lunch order had to include a food item from each section of the canteen menu (lunch, drink and snack).

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### Number – Lunch order

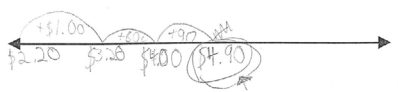
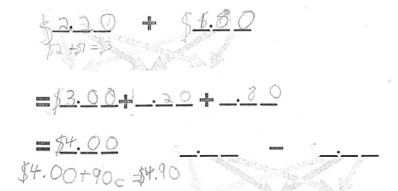


### SPECIAL LUNCH CHALLENGE

<b>Lunch:</b> <u>Medlows Pizza</u>	<b>Price:</b> <u>\$2.20</u>
<b>Drink:</b> <u>Day water</u>	<u>\$1.80</u>
<b>Snack:</b> <u>custard cup</u>	<u>0.90c</u>
<b>Total:</b> (remember to tape your expected change on the bag)	<u>\$4.90</u>

**Special Lunch Challenge**

**None**

Round      +      =      +      =     

Adjust      =     

Round      -      =      +      =     

Adjust      =

### Annotations

*Calculates expected change and selects coins to represent.*

*Calculates the cost of lunch using addition.*

*Calculates the cost of lunch using addition.*

*Calculates cost of lunch using the split strategy with scaffolding.*

#### 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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## Number – All about a fraction

### Relevant parts of the achievement standard

*By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.*

*Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.*

### Summary of task

Students had completed a unit of work on fractions looking at fractions as part of a whole and fractions as part of a collection. They also investigated which fractions are bigger and smaller and where they fit on a number line.

Students were asked to choose a fraction and record everything they knew about it. They were given access to all classroom resources to complete the task. They were also asked to answer the following question:

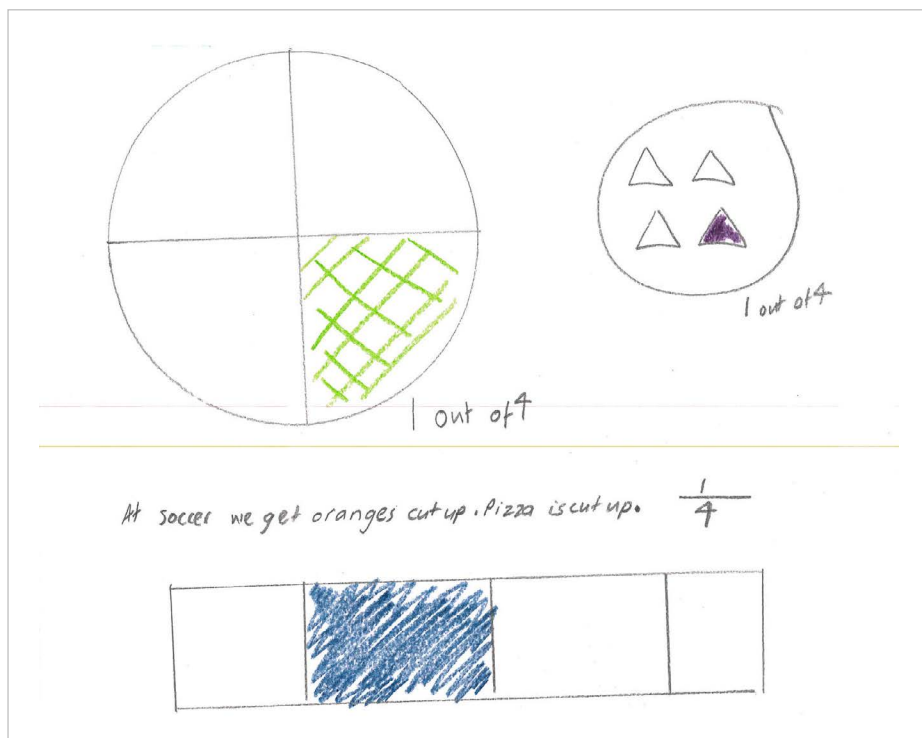
Explain how fractions are useful in everyday life.

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### Number – All about a fraction



#### Annotations

Identifies  $\frac{1}{4}$  of a collection.

Identifies  $\frac{1}{4}$  of a shape.

Identifies the use of fractions in everyday life.

#### Acknowledgement

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## Measurement – How much is there?

### Relevant parts of the achievement standard

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### Summary of task

Students had completed a unit of work on metric units for capacity, including hefting buckets of water, predicting, measuring using scales, reading and working with millilitres and litres.

Students were asked to complete a series of questions based on the previous classwork on estimating and reading capacity levels.

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### Measurement – How much is there?

#### Millilitres and litres

1. How many millilitres are in 1 litre? 1000

2. How much liquid is in each of the 3 jugs below? Write your answer below each jug.



<u>20</u> ml <u>1</u> L	<u>1400</u> ml <u>2</u> L	<u>600</u> ml <u>1</u> L
----------------------------	------------------------------	-----------------------------

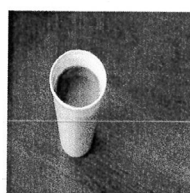
3. How much liquid would each container roughly hold below. Write down your estimate (eg: 200ml - 250ml).

A cup of coffee

A water bottle

A bottle of milk

A can of fizzy cordial



400ml      800ml      2L      175ml

#### Annotations

*Demonstrates an awareness of the relationship between metric units for capacity.*

*Estimates capacity of familiar items.*

#### Acknowledgement

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### Measurement – How much is there?

4. The jugs below can hold 1 litre each when filled to the top. Colour in each jug for each different measurement below:



1 L



500ml



250 ml



750 ml

#### Annotations

*Estimates relative capacity of familiar items.*

#### Acknowledgement

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## Geometry – What is on my island?

### Relevant parts of the achievement standard

*By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.*

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### Summary of task

Students had completed a unit of work on mapping that involved exploration of a range of maps with interactive white board activities, atlases and games such as Battleships.

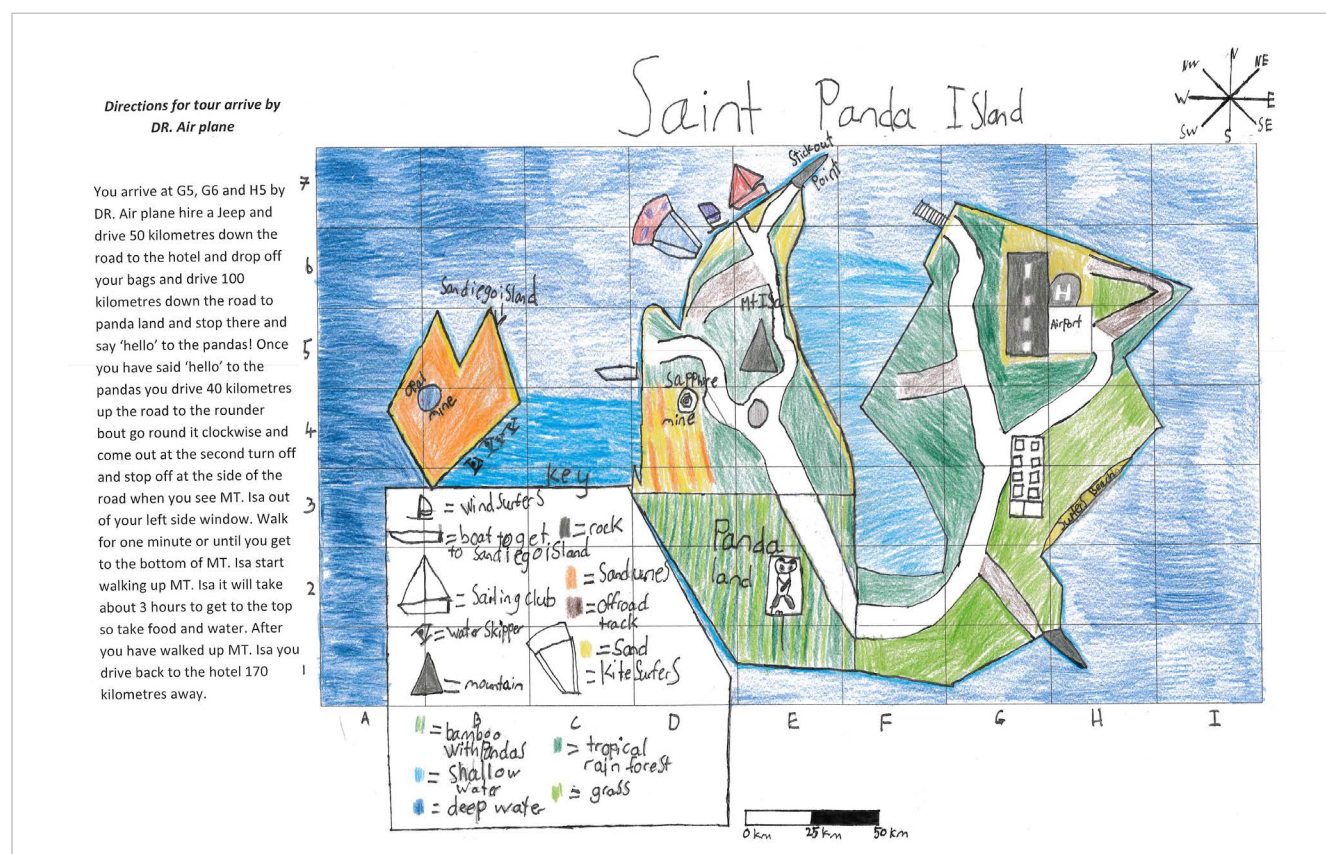
Students were given grid references linked to entry and exit points of locations on a map. From the information given, they had to draw a map and write directions for locations on the map. Students were given a week to complete the task.

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### Geometry – What is on my island?



### Annotations

*Describes a route around the island using positional language.*

#### Acknowledgement

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## Number – Neighbourly numbers

### Relevant parts of the achievement standard

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### Summary of task

Students had investigated odd and even numbers and whether they could be grouped into twos. They had also investigated the results of adding two even and two odd numbers.

Students brainstormed all they knew about odd and even numbers. They then completed the task. They were encouraged to try adding mentally first and to check their total using a calculator for larger calculations. Students used colour to highlight patterns that they identified. Neighbourly numbers had been discussed and investigated.

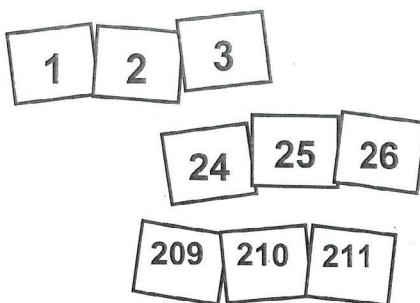
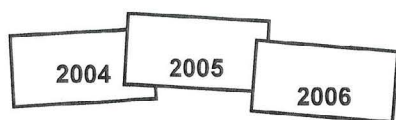
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### Number – Neighbourly numbers

My neighbourly numbers



What happens when you add three numbers in a row?  
Use blocks or square paper or just add up in your head!  
Choose your own numbers and write down the sums you make.

7	+	3	+	3	=	13
2	+	4	+	6	=	12
3	+	3	+	3	=	9
9	+	1	+	2	=	13
4	+	4	+	4	=	12
1	+	1	+	1	=	3
5	+	5	+	1	=	11
2	+	2	+	2	=	6
100	+	100	+	100	=	300

400	+	400	+	400	=	1200
1000	+	1000	+	1000	=	3000
1000	+	200	+	200	=	1400
50	+	50	+	50	=	150
3000	+	100	+	100	=	3200
200	+	100	+	100	=	400
5	+	3	+	2	=	10
10	+	10	+	10	=	30
50	+	20	+	20	=	90

#### Annotations

Labels numbers as odd or even.

#### 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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### Number – Neighbourly numbers

#### ODD and Even numbers

I know that three is a odd  
number but it can equal up  
to a lot of numbers  
like  $3 + 7 = 10$   $3 + 3 = 6$

#### Annotations

*Identifies an odd number.*

#### Acknowledgement

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## Geometry – Symmetry

### Relevant parts of the achievement standard

*By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.*

*Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables*

### Summary of task

Students had completed a unit of work on identifying symmetry in shapes and objects in the environment.

Students were given two lines of symmetry and asked to find shapes and objects that had the lines of symmetry and to record their findings.



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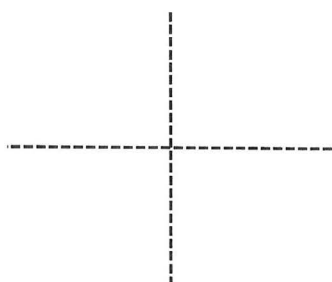
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### Geometry – Symmetry

#### Annotations

Here are 2 lines of symmetry.



What shapes and objects can you find that they could belong to?

O, X, H



this is not Symmetrical  
because it is not the  
same on both sides



Two lines of Symmetry  
because both sides are exactly the same

Identifies letters with symmetry.

Draws the axes of symmetry on a shape.

Describes symmetry as a mirror image.

#### Acknowledgement

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## Geometry – Smaller than a square

### Relevant parts of the achievement standard

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### Summary of task

Students had completed a unit of work on identifying angles as measures of turn and the comparison of angle sizes.

Students were asked to identify angles that were smaller than, the same as and larger than a corner of a square.

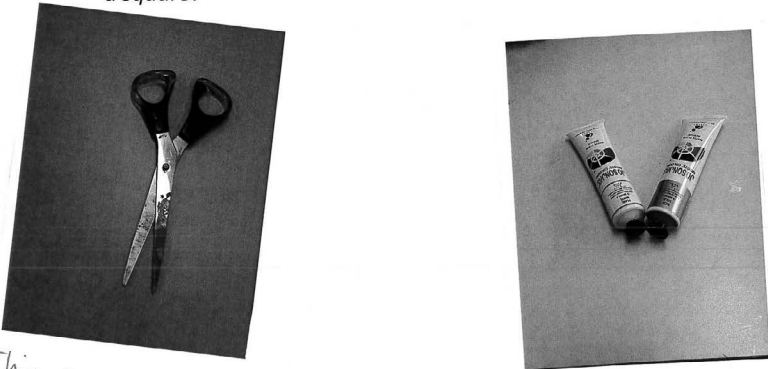
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### Geometry – Smaller than a square

What angles can you find that are smaller than the corner of a square?



This is a acute angle because it is smaller than a right angle.

This is a acute angle because the ends touch together

#### Annotations

Identifies objects that make an angle.

Identifies and describes an acute 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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## Statistics – Ice-cream flavours

### Relevant parts of the achievement standard

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### Summary of task

Students had completed a unit of work that included collecting data, drawing tables and graphs and discussing their findings compared with other students.

Students were given a task to survey the class about their favourite ice cream flavour. Using the data they had collected they were asked the following questions:

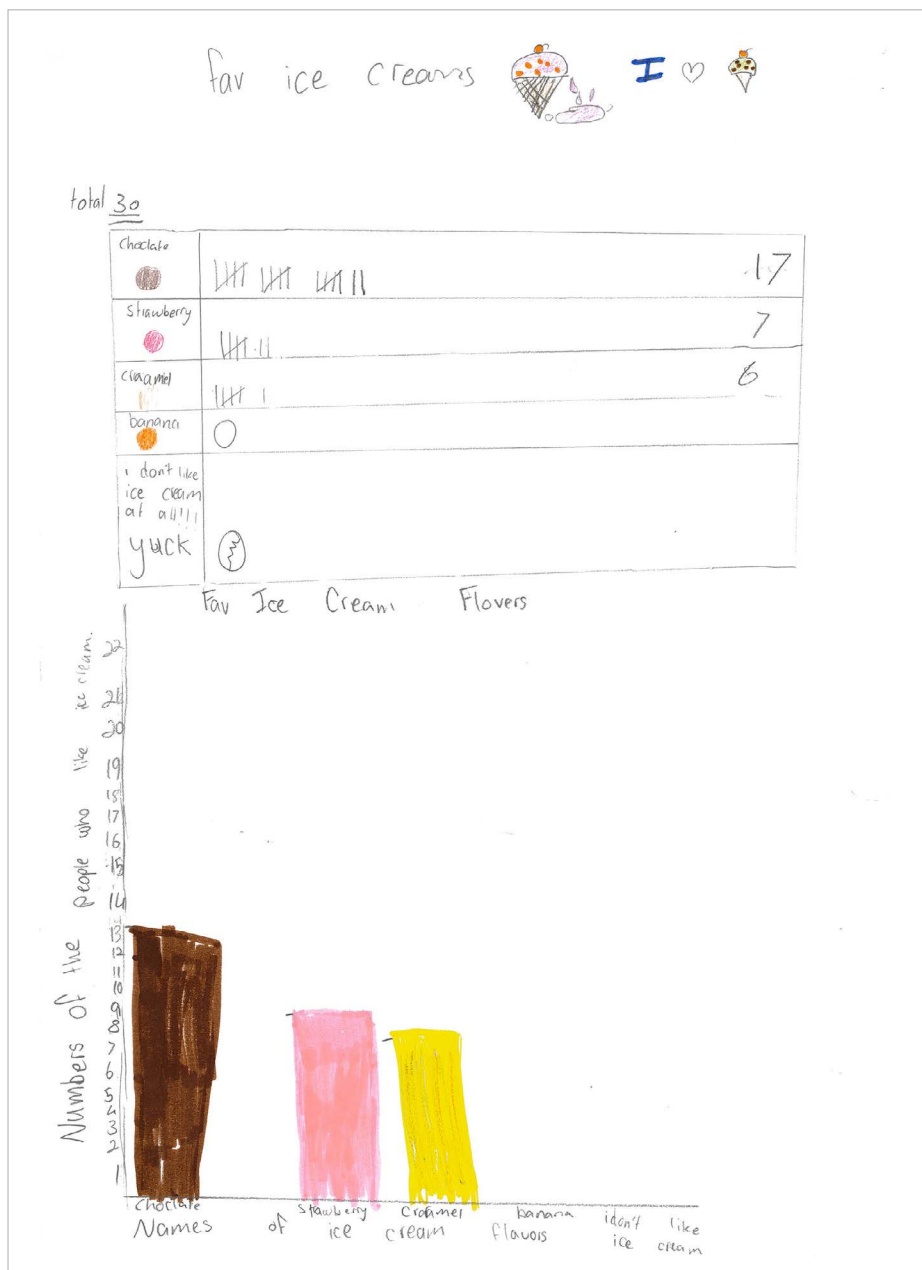
- Can you create a table and a graph to show what these findings could look like?
- What type of graph is most suitable and why?
- How will you record your work?
- How can you explain your graph?
- How do your results compare with others?

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### Statistics – Ice-cream flavours



#### Annotations

Records data in a table.

Constructs a simple column graph.

Labels the axis of a column graph.

#### Acknowledgement

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## Number – Apple Orchard

### Relevant parts of the achievement standard

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### Summary of task

Students had completed a unit of work on addition, multiplication and their connection and also using efficient mental and written strategies to solve problems.

Students were asked to answer the following question:

Sandie grew apple trees in orchards. One sunny Sunday she picked 24 apples from the trees in one of her orchards. Each tree had the same number of apples on it. How many trees could be in that orchard and how many apples on each tree?

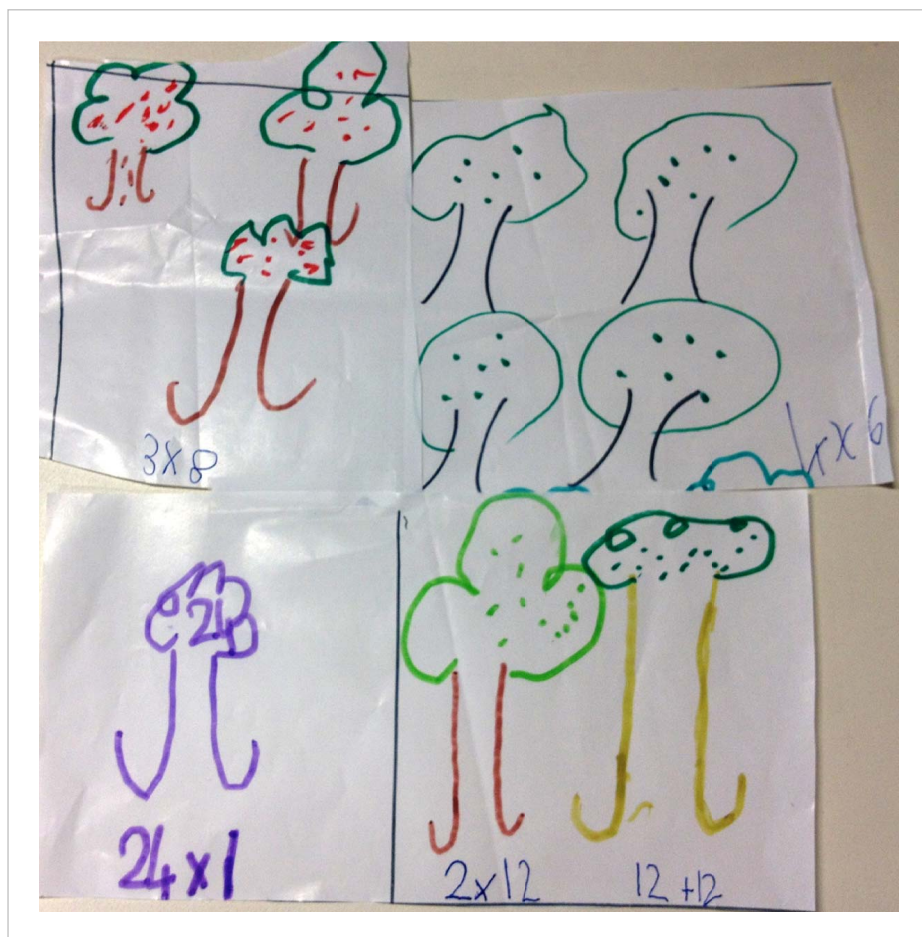
Can you think of another number of apples that Sandie could pick from another one of her orchards? If so how many trees could be in the orchard and how many apples on the tree?

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### Number – Apple Orchard



#### Annotations

*Demonstrates a connection between a picture representation and a multiplication number sentence.*

*Draws a picture to model multiplication.*

*Demonstrates an understanding of the link between multiplication and addition for one fact.*

#### Acknowledgement

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## Algebra – 20 Charlie

### Relevant parts of the achievement standard

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### Summary of task

Students had completed a unit of work identifying the rules for number patterns and then continuing the patterns or creating patterns.

Students were asked to solve the following problem:

Charlie created an addition number pattern which contained the number 20. What could the pattern be?

What other possibilities are there? Can you describe the rules for each of your patterns? How do you know if you have found all of the possibilities? What if your pattern also had to contain the number 36? If you had to create a subtraction pattern containing the number 20, explain why or why not the patterns could be the same as before.



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### Algebra – 20 Charlie

Charlie created an addition number pattern which contained the number 20.

What could the pattern be?

*I added 5 on to each number*  
5, 10, 15, 20, 25, 30, 35, 40  
45, 50, 55, 60, 65, 70, 75, 80, 85, 90  
95, 100, 105  
*I added 10 on each time*  
10, 20, 30, 40, 50, 60, 70, 80, 90, 100  
110, 120, 130, 140, 150, 160, 170, 180  
4, 8, 12, 16, 20, 24, 28, 32, 36  
*every number I added 4 on each number*  
2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22  
1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13  
14, 15, 16, 17, 18, 19, 20, 21, 22  
23, 24, 25, 26, 27, 28, 29, 30  
31, 32, 33, 34, 35, 36

#### Annotations

Identifies the counting sequence in the number pattern.

Creates and continues number patterns involving addition.

#### Acknowledgement

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## Measurement – Time

### Relevant parts of the achievement standard

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### Summary of task

Students completed a unit of work involving o'clock, half past, quarter to and quarter past as students didn't have this prior knowledge. Then the class progressed to telling the time to 5 minute intervals and to the minute.

Students were asked to use an interactive environment to teach someone how to tell the time to the minute.

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## Measurement – Time



### Annotations

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