

## Mathematics

**Year 3**  
Below satisfactory

### WORK SAMPLE PORTFOLIO

Annotated work sample portfolios are provided to support implementation of the Foundation – Year 10 Australian Curriculum.

Each portfolio is an example of evidence of student learning in relation to the achievement standard. Three portfolios are available for each achievement standard, illustrating satisfactory, above satisfactory and below satisfactory student achievement. The set of portfolios assists teachers to make on-balance judgements about the quality of their students' achievement.

Each portfolio comprises a collection of students' work drawn from a range of assessment tasks. There is no pre-determined number of student work samples in a portfolio, nor are they sequenced in any particular order. Each work sample in the portfolio may vary in terms of how much student time was involved in undertaking the task or the degree of support provided by the teacher. The portfolios comprise authentic samples of student work and may contain errors such as spelling mistakes and other inaccuracies. Opinions expressed in student work are those of the student.

The portfolios have been selected, annotated and reviewed by classroom teachers and other curriculum experts. The portfolios will be reviewed over time.

*ACARA acknowledges the contribution of Australian teachers in the development of these work sample portfolios.*

### THIS PORTFOLIO: YEAR 3 MATHEMATICS

This portfolio provides the following student work samples:

Sample 1	Number: Addition and subtraction
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
Sample 12	Number: What's my change?
Sample 13	Probability: Chance experiment

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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 identifies symmetry and angles in their environment (WS6, 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). The student role plays a financial transaction, selecting the notes and coins to pay for an item and calculating the correct change (WS12). The student conducts a chance experiment and identifies possible outcomes (WS13).

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# Mathematics

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## Number: Addition and subtraction

### Year 3 Mathematics achievement standard

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*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

The assessment task was given at the end of a unit of work in which students explored the relationships and connections between addition and subtraction.

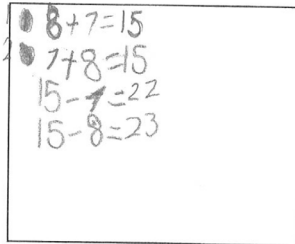
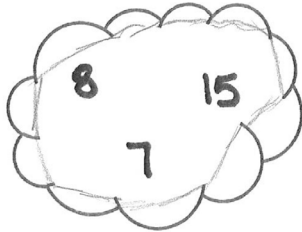
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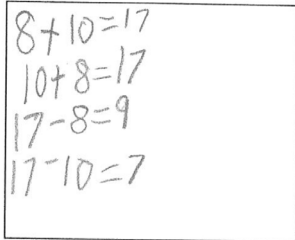
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Number: Addition and subtraction

Use the numbers in the cloud to write three different number sentences.



Choose three other numbers that you can use the same pattern to write number sentences.



Charlie choose the numbers 1, 2, 3 and 6 and wrote some number sentences. He found out that

$1 + 2 = 6 - 3$  How many other sentences can you find?

Handwritten list of equivalent number sentences:  
 $1 + 2 = 6 - 3$   
 $2 + 1 = 6 - 3$   
 $6 + 3 = 2 - 1$   
 $3 + 6 = 2 - 1$

Can you choose four different numbers for Charlie to write number sentences?

Handwritten list of equivalent number sentences:  
 $1 + 3 = 6 - 5$   
 $1 + 3 = 6 - 5$   
 $3 + 1 = 6 - 5$   
 $6 + 5 = 3 - 1$   
 $5 + 6 = 3 - 1$

Can you explain a connection between addition and subtraction?

Handwritten explanation: "the big numbers go at the start and the little number goes at the end and PLUS the numbers and taking them as well at the end of the sums like  $4+6=10$  or  $4+6=10$  and then you take away the PLUS and make it into take away and this is what it looks like  $10-6=4$ , that's what it looks like." Below the text are the equations  $10-6=4$  and  $10-4=6$ .

Annotations

Represents addition facts, using the equals sign to indicate the result of an operation.

Repositions numbers in a modelled number sentence to show an equivalent number sentence.

Selects four numbers that cannot be used to generate equivalent number sentences.

Understands the larger number is placed at the beginning of subtraction number sentence.

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## Number: All about a fraction

### Year 3 Mathematics achievement standard

The parts of the achievement standard targeted in the assessment task are highlighted.

*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.*

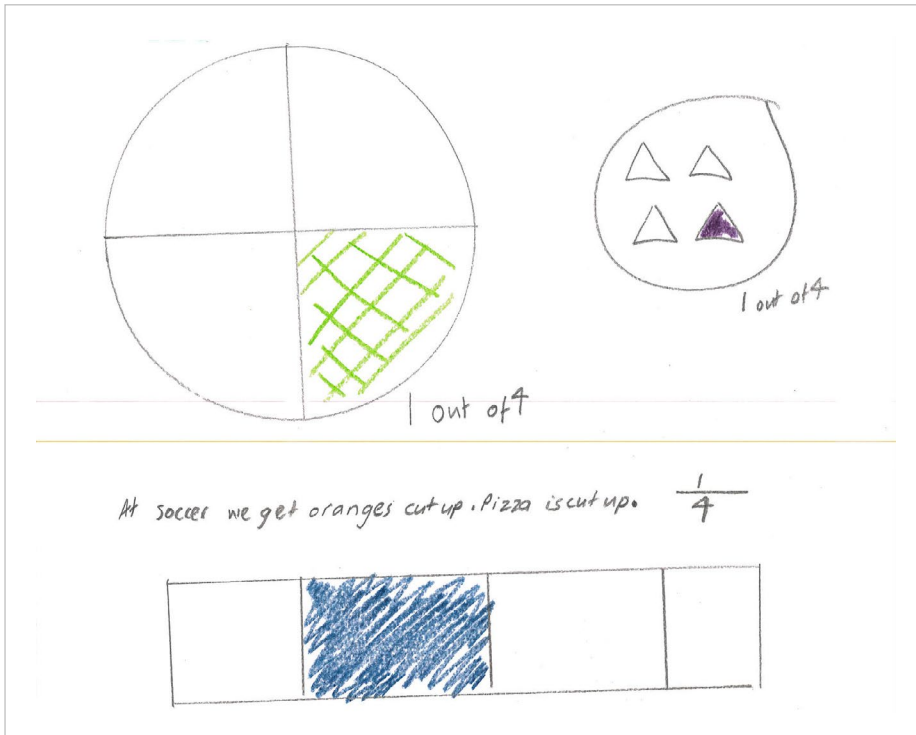
### Summary of task

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.

Number: All about a fraction



Annotations

Identifies 1/4 of a collection.

Identifies 1/4 of a shape.

Identifies the use of fractions in everyday life.

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## Measurement: How much is there?

### Year 3 Mathematics 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.

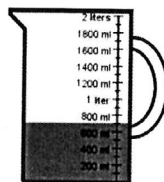
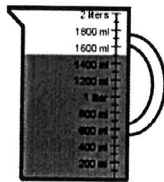
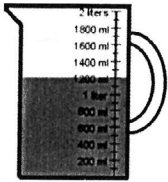
Students were asked to complete a series of questions based on the previous classwork on estimating and reading capacity levels.

# 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
----------------------------	------------------------------	-----------------------------

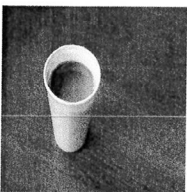
3. How much liquid would each container roughly hold below. Write down your estimate (eg: 200ml - 250ml).

A cup of coffee

A water bottle

A bottle of milk

A can of fizzy cordial



400ml      800ml      2L      175ml

## Annotations

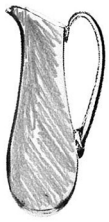
*Demonstrates an awareness of the relationship between metric units for capacity.*

*Estimates capacity of familiar items.*



## 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.*

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## Geometry: What is on my island?

### Year 3 Mathematics achievement standard

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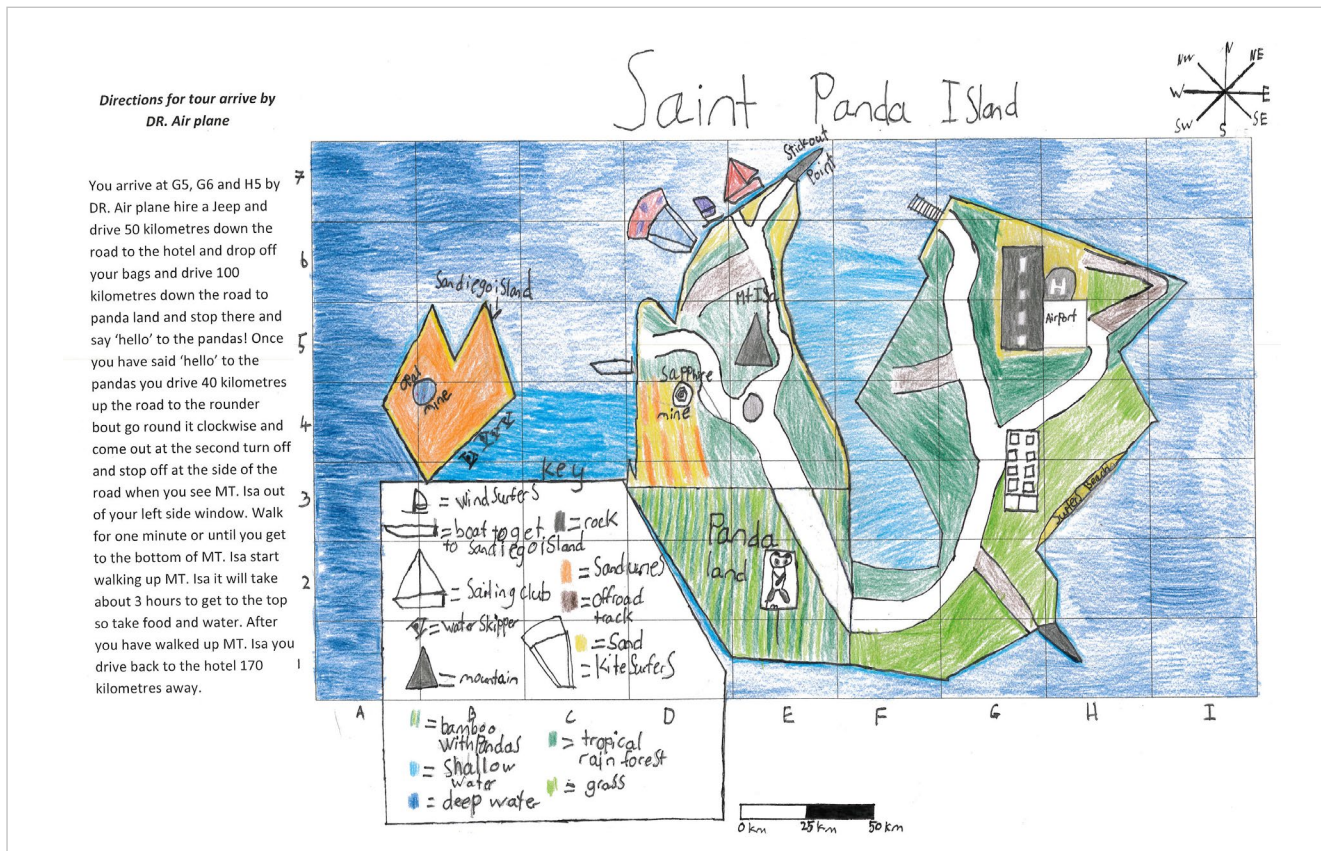
*Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric 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 mapping that involved exploration of a range of maps with interactive whiteboard 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.

# Geometry: What is on my island?



## Annotations

Describes a route around the island using positional language.

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## Number: Neighbourly numbers

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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.

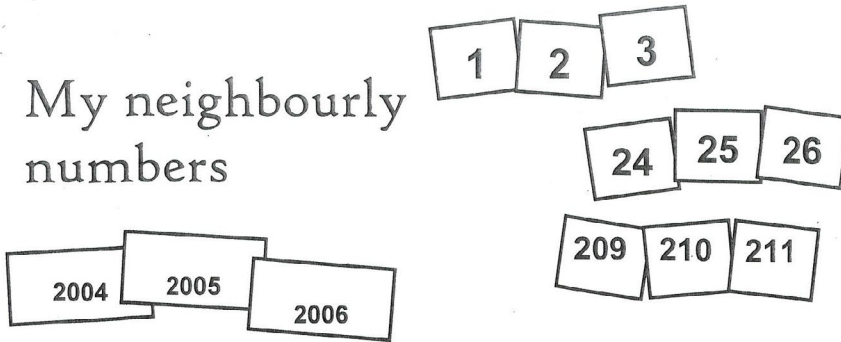
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Number: Neighbourly numbers

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.

<sup>o</sup> 7	+	3	+	3	=	13
<sup>e</sup> 2	+	4	+	6	=	12
<sup>o</sup> 3	+	3	+	3	=	9
<sup>o</sup> 9	+	1	+	2	=	13
<sup>e</sup> 4	+	4	+	4	=	12
<sup>o</sup> 1	+	1	+	1	=	3
<sup>o</sup> 5	+	5	+	1	=	11
<sup>e</sup> 2	+	2	+	2	=	6
<sup>o</sup> 100	+	100	+	100	=	300

<sup>e</sup> 400	+	400	+	400	=	1200
<sup>o</sup> 1000	+	1000	+	1000	=	3000
<sup>o</sup> 1000	+	200	+	200	=	1400
<sup>e</sup> 50	+	50	+	50	=	150
<sup>e</sup> 3000	+	100	+	100	=	3200
<sup>e</sup> 200	+	100	+	100	=	400
<sup>o</sup> 5	+	3	+	2	=	10
<sup>e</sup> 10	+	10	+	10	=	30
<sup>e</sup> 50	+	20	+	20	=	90

Annotations

Labels numbers as odd or even.

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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.*

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## Geometry: Symmetry

### Year 3 Mathematics achievement standard

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### Summary of task

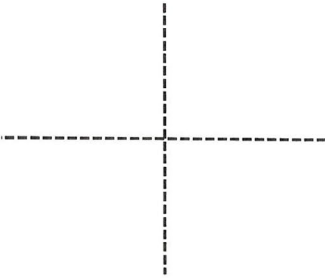
Students had completed a unit of work on identifying symmetry in shapes and objects in the environment.

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.

# Geometry: Symmetry


## Annotations

Here are 2 lines of symmetry.

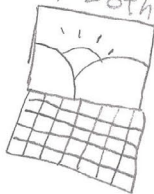


What shapes and objects can you find that they could belong to?

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.



## Mathematics

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**Geometry: Smaller than a square****Year 3 Mathematics 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.

## 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 then 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.*

## Mathematics

## Year 3

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## Statistics: Ice-cream flavours

## Year 3 Mathematics achievement standard

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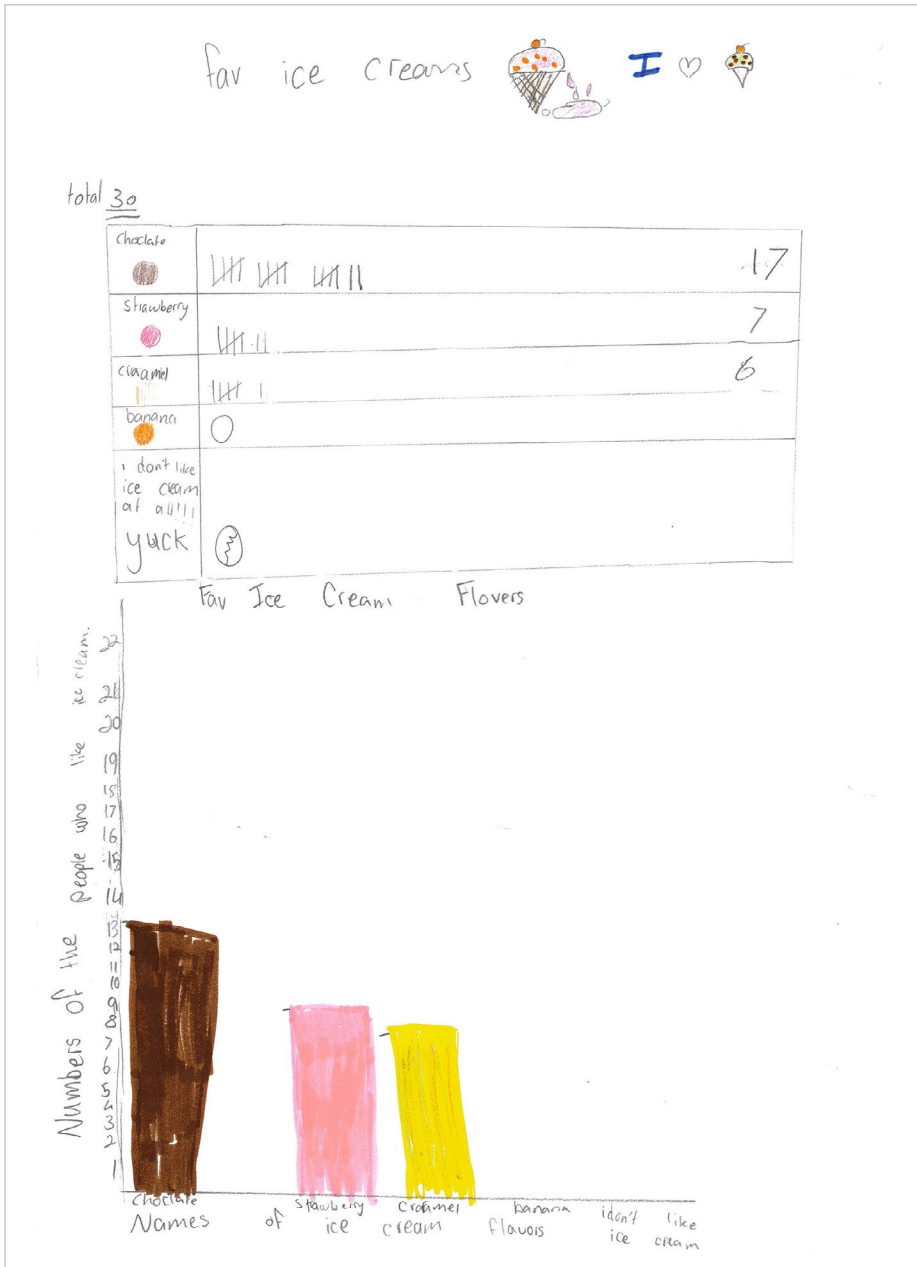
## Summary of task

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?

Statistics: Ice-cream flavours



Annotations

Records data in a table.

Constructs a simple column graph.

Labels the axes of a column graph.

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## Number: Apple orchard

### Year 3 Mathematics achievement standard

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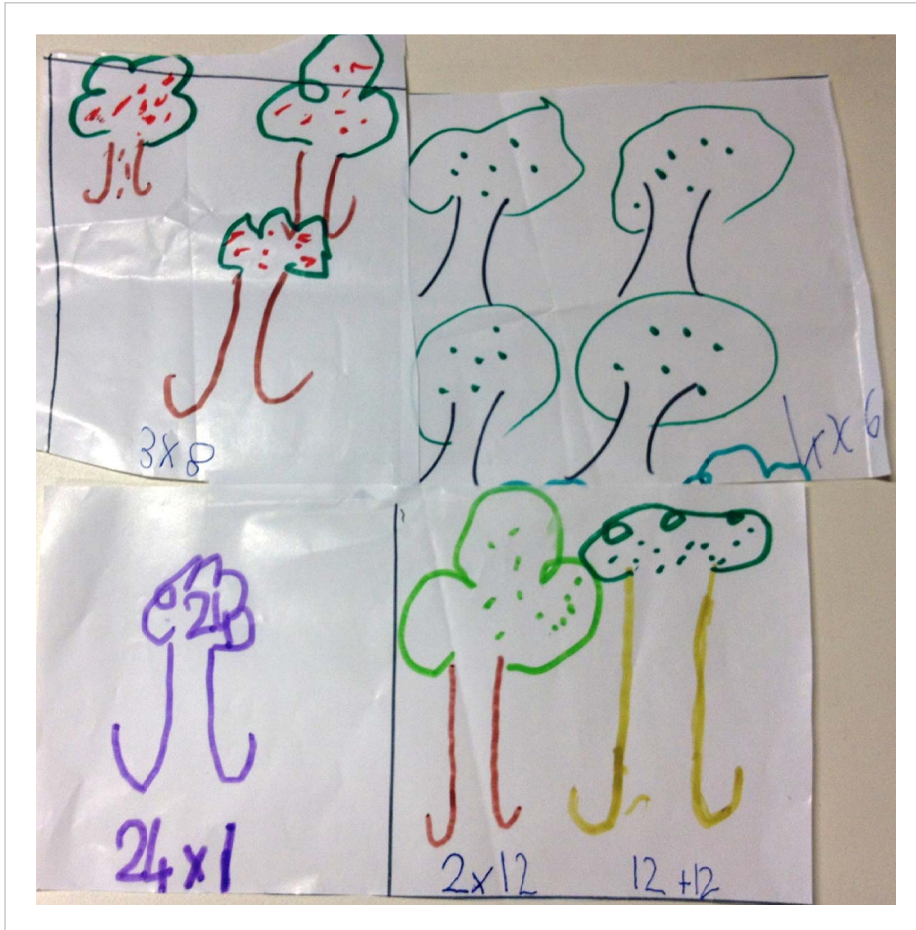
### Summary of task

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?

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.*

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## Algebra: 20 Charlie

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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 10 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, 190, 200

*every number I R 14 on each number*  
 4, 8, 12, 16, 20, 24, 28, 32, 36

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.



# Mathematics

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## Measurement: Time

### Year 3 Mathematics 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 five-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



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## Number: What's my change?

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### Summary of task

The students had spent two weeks learning about how to make different amounts of money using different coins and notes. They also practised buying items and giving change using play money. At the time of the task the school was busy preparing and planning for the school fair.

Students had to choose items from the plant stall, lolly stall or craft stall and work out what note they should use to buy the item and how much change they would receive.

Stall A: Plant Stall		Stall B: Lolly Stall		Stall C: Craft Stall	
Bunch of flowers	\$6.50	Nougat	\$1.50	Headband	\$4.50
Strawberry plant	\$4.75	Mint Slice	\$3.20	Hairbands	\$3.75
Aloe Vera	\$7.00	Lolly Jar	\$6.00	Crochet flower	\$5.50
Cactus	\$5.20	Choc Top	\$1.75	Fingerprint	\$3.00
Bunch of Roses	\$8.60	Coconut Ice	\$1.30	Playdough	\$5.95
Parsley	\$2.80	Gingerbread	\$1.00	Knitting	\$1.50
Tomatoes	\$3.15	Choc Balls	\$2.75	Sock Snowmen	\$7.55
Fern plant	\$12.00	Chocolates	\$1.65	PRICE LIST	
Lillies	\$6.00	Fairy floss	\$3.50		

# Mathematics

Year 3  
Below satisfactory

## Number: What's my change?

### What's My Change?

Choose an object from each of the three Fair stalls and then work out which note you would use to buy the object and then which coins and/or notes you would expect to receive in change.

	Object	Price	Notes: Circle the notes you would use to buy your object.	Record using the stamps the change you would receive
Stall A A	Lillies	\$6.00		
Stall B B	Ginger bread	\$1.00		
Stall C C	Fingerprint	\$3.00		
Stall A A	cash	\$5.20	5   10   20   50   100	

### Annotations

Calculates change for transactions involving whole-dollar values using hands-on materials.

Selects dollar note with smallest possible value to purchase item.

Selects items that have a whole-dollar value and avoids items involving dollars and cents.

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Mathematics

Year 3  
Below satisfactory

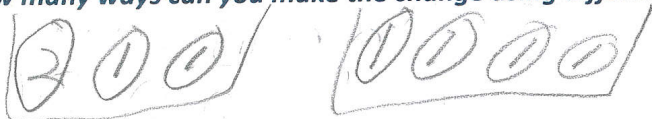
Number: What's my change?

- Choose one item from the table above and use different coins to show the same amount of change

\$4.00 stall A



- How many ways can you make the change using different coins?



- You are given \$12 change from \$20 – what could the shopper have bought from the fair stalls?

Lolly jar 6 | 2 Gingerbread.

Annotations

Identifies alternative ways of representing whole-dollar values but does not consider denominations smaller than one dollar.

Provides a solution to an open problem selecting items with whole-dollar values.

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## Mathematics

## Year 3

Below satisfactory

**Probability: Chance experiment****Year 3 Mathematics achievement standard**

The parts of the achievement standard targeted in the assessment task are highlighted.

*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**


The assessment task was given at the end of a unit of work in which students had completed different experiments to identify the possible outcomes of events. They were introduced to the mathematical term 'outcome'. The students were instructed to play a game of chance using two dice and then investigate if the game was fair.

# Probability: Chance experiment

## Annotations

**Chance Experiment.....**

**Is it Fair?**



Game: This is a 2 person game. You and your partner roll 2 ordinary six-faced dice at the same time and then add the two numbers together.

Player A wins if 2,3,4,5,6,7  
 Player B wins if \_\_\_\_\_  
 (I will reveal these totals after you have answered the questions below.)

Before you start: List some of the results you could get.  
12 4 11 5 13 6 7

Does this game seem fair to you?  
No  
 (Yes) I think it will be <sup>not</sup> fair because <sup>it have</sup> different numbers.

Play the game: The first person to 10 throws is the overall winner.  
 Record your results below:  
 A: |||||  
 B: |||||      B won

Share the results with your group. Record your groups results below:  
 A = 27  
 B = 29

What do you think now? Was this game fair?  
Yes

Do you have more chance of getting one answer than any other? If so, what is that answer? And why?  
don't I not

Identifies some of the possible outcomes of a chance experiment.

Provides an opinion about the fairness of a game and explains their thinking.

Conducts a simple chance experiment.

Adjusts opinion about the fairness of the game based on the result of the chance experiment.