Mathematics

Year 4
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 – Cinema timetable
Sample 10	Number – Giving change
Sample 11	Statistics – Collect, display, interpret
Sample 12	Measurement – Angles

Mathematics

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) they converted time from minutes to hours and demonstrated understanding of digital, analogue and 24 hour time (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). The student solved problems to determine the cost of items and calculated change (WS10) and interpreted tables to construct an appropriate data display (WS11). The student identified angles found in the environment (WS12).

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.*

Mathematics

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:

Lucy was arranging some candles on her birthday cake.
When she placed them in 2 equal rows, there was 1 left over.
When she placed them in 3 equal rows, there were 2 left over.
How old could Lucy be turning?

Mathematics

Number – Lucy's birthday

Annotations

Uses arrays as a strategy to make calculations.

Uses diagrams to solve problems.

Explains answers referring to arrays.

Recognises that there are other possible solutions to the problem.

Mathematics

Year 4
Satisfactory

Number – Multiplication

Relevant parts of the achievement standard

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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.

Mathematics

Year 4
Satisfactory

Number – Multiplication

Annotations

> Can you create a multiplication number pattern that includes the number 60? My rule is 3 ×
>
> 3, 6, 9, 12, 15, 18, 21, 24,
> 27, 30, 33, 36, 39, 42, 45,
> 48, 51, 54, 57, (60)
>
> This is the 20th turm.
>
> These are some of the numbers that would definitely be in the 3× table pattern is 90 because 30 is the tenth turm and if you times that by 3 you get 90.
>
> I new that 90 was in it so you would be able to have 2 90's in it which, 90 + 90 = 180 would add up to 180. If 180 is in it 2, 180's would be in it which
>
> 90 + 90 = 180
>
> 180
> +180
> ‾‾‾‾‾
> = 360
>
> 360
> ×   3
> ‾‾‾‾‾
> 1080

Creates a multiplication number pattern that includes 60.

Demonstrates and justifies an understanding of the problem.

Calculates and justifies why larger numbers are in the pattern.

Mathematics

Number – Multiplication

would add up to 360 and if 360
is in it you could times it by 3
and it would add to 1080.

1079 would not be in the 3x table
pattern because I know that 1080 is
in it so 1077 is three less than 1080.
1079 is just one away from 1080.

Annotations

Mathematics

Year 4
Satisfactory

Geometry – Quadrilaterals

Relevant parts of the achievement standard

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Summary of task

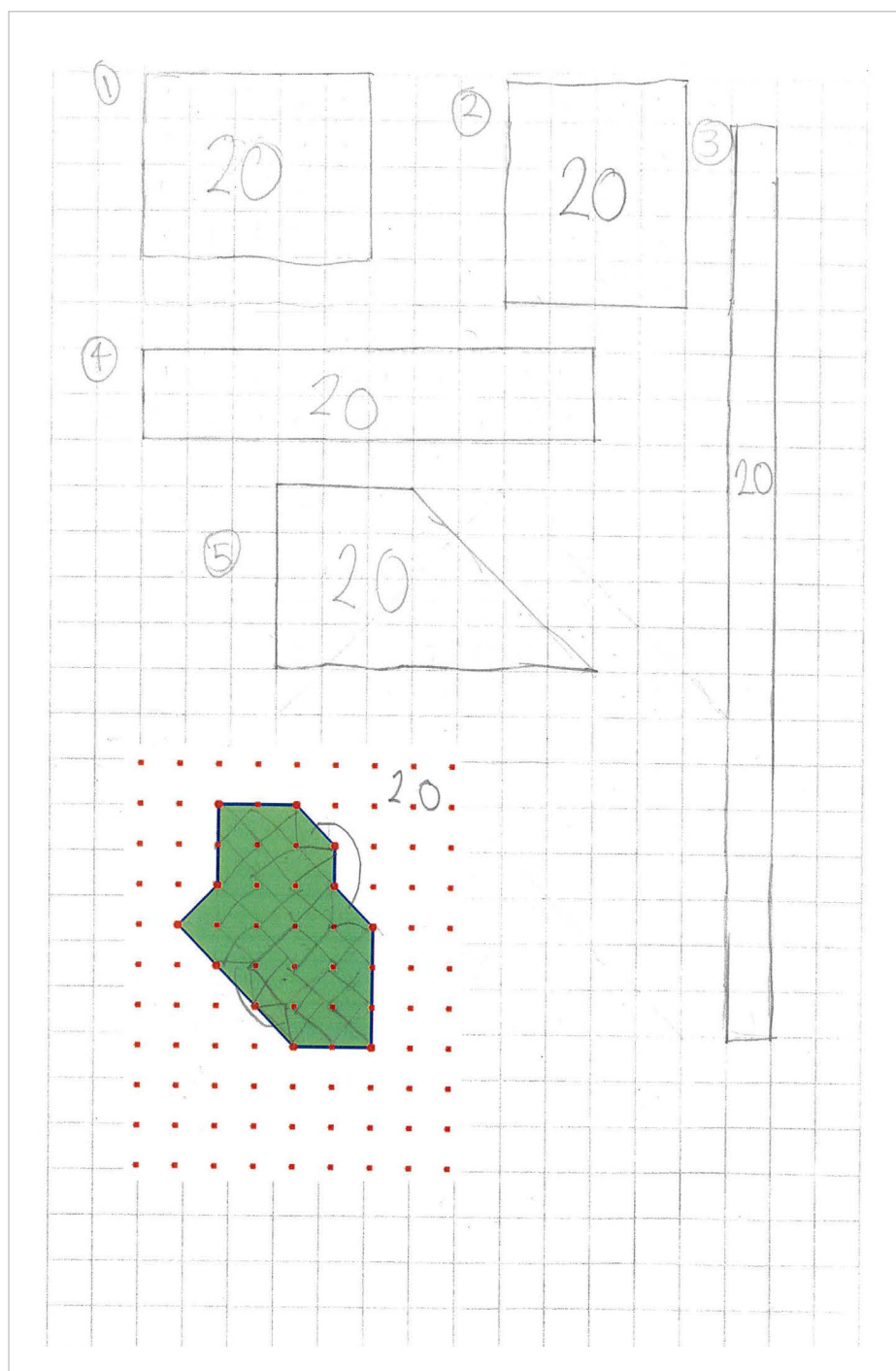Students had completed a unit of work on two dimensional shapes, their properties and their area.

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

Mathematics

Geometry – Quadrilaterals

Annotations

Finds all rectangles with the same area as the irregular shape.

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

Mathematics

Number – Odd and even

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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.

Mathematics

Number – Odd and even

Annotations

Anna added three consecutive numbers together and the answer was an odd number. What numbers might they have been?

110
111
+112
----
4 3 3 4

9 4
+113
----
3 3 6

9 13
+115
----
3 3 2

116
+118
----
3 4 3

119
129
+12

122
123
124

125
126
127

360 370 378

this one dosn't work because even.

this sum works because is odd.

you can't add any consectutive numbers because of the odd even Patterns it stops you from you getting all the answers being odd or even. If you add an even and even together you get an even. If you add odd and odd together you get even.

Selects and adds three consecutive numbers.

Investigates a variety of additions of three consecutive numbers to see which groupings give an odd or even sum.

Draws conclusions based on calculations.

Generalises the results based on calculations.

Mathematics

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.

Mathematics

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.

16	45	8	10
68	4	40	2
15	12	18	50
36	20	6	30

Annotations

Demonstrates knowledge of possible products to multiplication facts.

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

I chose 2 to put on my grid because it is my lucky number. I also chose 16 because it appers 4 times on a 10x10 grid 15 is on my grid because it appers 3 times. another number I put on is 6 because it appers 3 times

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

I didn't chose 100 because it only appers once on a 10x10 grid. I didn't want to have 13 on my grid. Because it dosen't apper once on the 10x10 grid.

Demonstrates knowledge of more common products and justifies why these numbers were chosen.

Demonstrates knowledge of less common products of multiplication facts by using the tool of a 10 by 10 grid.

Mathematics

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.

Mathematics

Geometry – Symmetry

What different shapes with more than 4 sides can you create that have at least one line of symmetry?

3 lines
pentagon

octagon 4 lines

4 lines
Double Decagon
(50° Peace)

1+4=5 more
than 4
1 line of
symmetry

4 sides
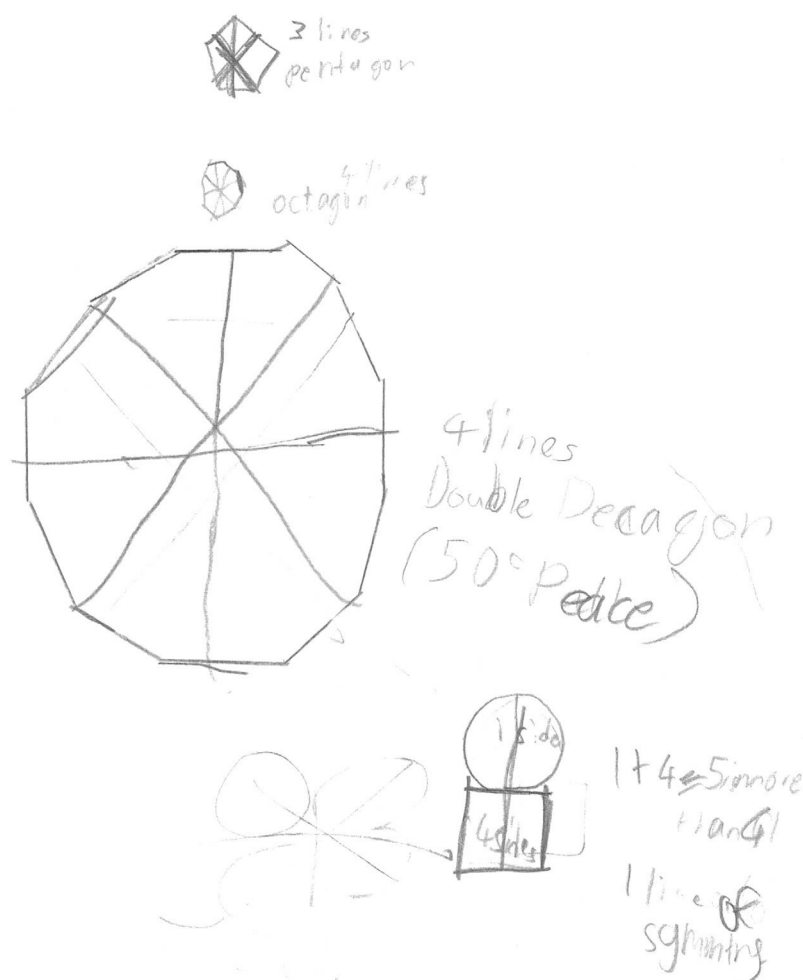
Annotations

Draws shapes with symmetry.

Identifies lines of symmetry of a shape.

Creates a shape and identifies the line of symmetry.

Mathematics

Geometry – Symmetry

Annotations

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

This shape is not symmetrical because it has a sharp end.

This is not a symmetrical shape because it goin uneven point.

Describes why a shape is not symmetrical.

Point

Creates asymmetrical shapes.
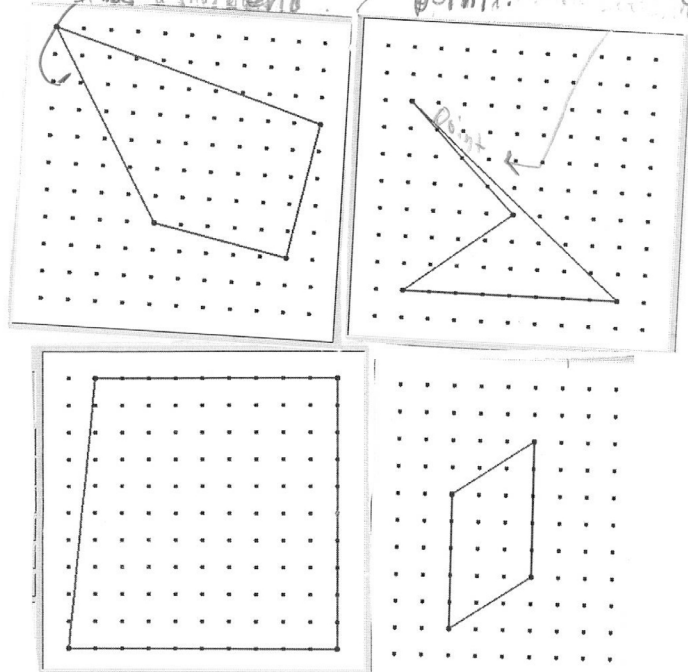
this is a square with a uneven point not symmetrical.

this is a peralleogram so it can't because it's a sloped rectangle.

these are all Quadralatrits because theyve got foursides but there all different shapes area length and angles

Makes generalisations about the features of asymmetrical shapes.

Mathematics

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.

Mathematics

Number – Sentences

Annotations

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 | 21	$14 + 7 = 21$
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?	17 | 12 | 29	$17 + 12 = 29$
The teddy bear weighs 25 grams. The toy car weighs 10 grams more than the teddy. How heavy is the car?	25 | 10 | 35	$25 + 10 = 35$
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 | 29	$8 + 21 = 29$
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?	30 | 15 | 15	$30 - 15 = 15$

Uses a table to collect information to solve problems.

Solves written problem using a subtraction number sentence.

Solves written problems using addition number sentences.

Mathematics

Number – Sentences

Annotations

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?	9 25 16	$9 + 16 = 25$
There was 30 MnMs in the bowl and when I got home from socer there was 14. H.M was Eaten?	14 ? 30	$30 - 14 = 16$

Writes a problem and calculates the answer from given information.

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

$12 + 13 = 25$ .... $25 - 12 = 13$

12	13
?	

$18 + 18 = 38$ $38 - 18 = 18$

18	?
38	

Mathematics

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 halves, 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.

Mathematics

Number – Fractions and decimals

Symbolic representation
Write your equivalent fractions

$\frac{4}{8}$

$\frac{2}{4}$

Write your equivalent fractions in words

four eighths

two quarters

Whole

Pictorial Representation

Collection

Equivalent Fractions

Write in decimal form

.50

at the shops as in it is $\frac{1}{2}$ off

Give an example of where you might see this fraction in a real life situation

Annotations

Creates a pictorial representation of the fraction.

States equivalent fractions.

Identifies where fractions can be seen in everyday life.

Writes in words equivalent fractions.

Writes the fraction in decimal form.

Mathematics

Number – Fractions and decimals
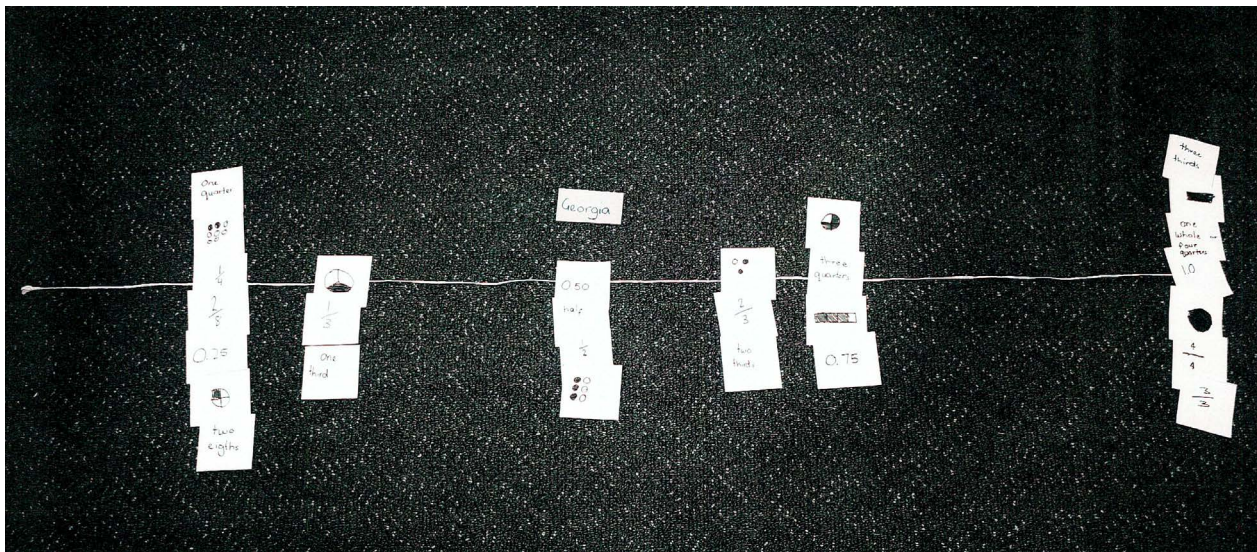
Annotations

Locates equivalent fractions and decimals on a number line.

Mathematics

Measurement – Cinema timetable

Relevant parts of the achievement standard

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Summary of task

Students were asked to create a cinema timetable using their choice of movies from a list. On their timetable, students were asked to include the start time of the movie in analogue, digital and 24 hour time and use am and pm. They were asked to convert the length of the movie into hours and minutes.

Mathematics

Measurement – Cinema timetable

Annotations

Cinema

Your task is to create a cinema timetable using your choice of movies. In your timetable you need to include:

- The start time of each movie in analogue time and digital time, try to use 24 hour time
- The name of each of your chosen movies
- The duration of each movie in minutes and then in hours and minutes

You need to make sure:

- The start time is clearly written on the timetable
- No movie starts before the previous movie has ended

Start time	Movie	Duration	
		Minutes	Hours and Minutes
8:00 am	Finding nemo	107mins	1hr 47mins
9:47 am	Brave	100min	1hr 40min
11:27 am	Hotel Transylvania	86mins	1hr 26mins

Adds time duration to existing time.

Mathematics

Measurement – Cinema timetable

Start time	Movie	Duration	
		Minutes	Hours and Minutes
12:57 am	Diary of a Wimpy kid	94 min	1hr 34 mins
1:31 pm / 13:31	kath and kim	85 mins	1hr 25 mins
2:56 pm / 15:56	MaDagascar 3 Europes most wanteD	93 mins	1hr 33 mins
3:29 pm / 18:29	Ice age 4 continental Drift	105 mins	1hr 45 mins
5:14 pm	—	—	—

Annotations

Adds the next time duration with minor errors.

Converts analogue time to 24 hour time.

Converts between minutes and hours and minutes.

Attempts to draw analogue time to the minute.

Mathematics

Number – Giving change

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit on money and financial mathematics. During the unit the students played games with a focus on recognising coins and notes.

Students had to calculate the change for given items and show the change that would be given. They also had to solve written money problems. The students were asked to work individually to complete the task.

Mathematics

Number – Giving change

Giving Change

Show the coins or notes you would get as change:

Cost	Paid	Change
$2.50	(five dollar note)	(coins)
$0.75	(coin)	(coins)
$6.25	(note, coin)	(coins)
$19.98	(twenty note)	NO change
$15.32	(ten note, coins)	(coins) Calculator.

1. I bought 3 packets of lollies for $1.00 each. I paid the shop keeper $5.00 in cash. How much change would I get? $2.00

2. I bought 5 pencils for 25cents each. I paid $2.00 in coins. How much change would I get? 75c

3. I bought a painting for $19.99. I paid with my EFTPOS bank card. How much does the picture cost me? 19.99 20.00

   How much would it cost if I paid with cash? 20.00

Annotations

Gives change from purchasing problems that end in zero or five cents.

Understands some of the conventions about rounding up.

Uses technology to determine the change given to simple purchasing problems.

Calculates change for rounding up.

Solves simple purchasing problems which involve giving change to totals ending in zero or five cents.

Understands the concept of EFTPOS and that this does not round the amount.

Demonstrates the difference between paying in cash or with EFTPOS.

Mathematics

Statistics – Collect, display, interpret

Relevant parts of the achievement standard

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Summary of task

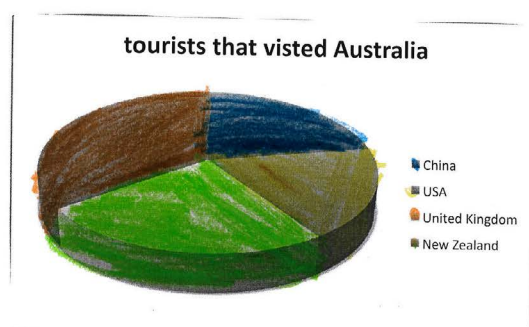Students had completed a unit of work of data collection and displays.

Students were asked to construct a data display that would best show the data in the table supplied and justify their choice.

Mathematics

Statistics – Collect, display, interpret

Data Assessment Part C

tourists that visted Australia

- China
- USA
- United Kingdom
- New Zealand

I chose the pie graph because you can read it easy. Et is very easy to under and see how many people came to Austrlia. The graph is also accurte because if I drawed it by hand it would have not been as good.

Annotations

Evaluates and explains the effectiveness of a pie graph.

Links the use of a particular graph to the data it represents.

Recognises the importance of accuracy in representing data and how the use of digital technology can enhance accuracy

Mathematics

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.

Mathematics

Measurement – Angles

Annotations