Mathematics

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 6 Mathematics

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

Sample 1	Number – Power
Sample 2	Number – How tall
Sample 3	Number – Abstract design
Sample 4	Number – My number line
Sample 5	Number – Fifth term
Sample 6	Geometry – Area
Sample 7	Number – Calculations
Sample 8	Geometry – 3D structure
Sample 9	Number – Percentages
Sample10	Geometry – Sam's square
Sample 11	Probability / Statistics – Spinner mania

This portfolio of student work demonstrates multiplying and dividing decimals by the power of 10 (WS1) and solving problems involving length and area using decimals (WS 2, WS 6). The student represents the same number as a fraction, decimal and percentage and locates fractions, decimals and percentages on number lines, calculates a fraction of a quantity and describes the use of fractions in everyday life (WS 3, WS 4). The student creates a sequence using whole numbers and fractions and explains the rule (WS 5), they calculate number sentences using whole numbers and decimals using all four operations involving brackets and order of operations (WS 7). The student draws nets and constructs a prism and a pyramid (WS 8) and plots squares on a Cartesian plane (WS10). The student uses reasoning to report probability using fractions, percentages and decimals (WS11) and explains and calculates percentages of sale items (WS9).

Mathematics

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:

- *recognise the properties of prime, composite, square and triangular numbers*
- *make connections between capacity and volume*
- *interpret timetables*
- *describe combinations of transformations*
- *solve problems using the properties of angles*
- *evaluate secondary data displayed in the media.*

Mathematics

Number – Power

Relevant parts of the achievement standard

By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media.

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Summary of task

Students had completed a unit of work on number involving multiplying decimals by multiples of powers of ten. Students were given an open ended task to relate their reasoning skills to answer the posed problem. Students were given one class lesson to complete the task.

Mathematics

Number – Power

Annotations

Year 6 Mathematics Task 2

Number and Algebra

Sam says that when you multiply 7.32 x 100, the answer is 73 200 because you add 2 zeros.

Will says that can't be right and that the answer is 732 because the decimal place moves.

Is anybody correct? yes

Will is correct but he needs more knowlidge to compleat more dificult multiplications.

- **How do you know who is right?**

I know Will is correct because I know you move the decimal place and the 0's are place Keepers.

Demonstrates an understanding that more information is required to calculate the answer.

Demonstrates an understanding of place value when multiplying decimals by a power of 10.

- **Can you try and multiply other decimals by 10, 100 and 1000 and find a pattern with the answers?**

	1,62	4.5
×10	16.2	45
×100	162	450
×1000	1620	4 500

the pattern is the decimal point is moved to the right one place for each 0 in the number you are multiping by.

Explains in detail how to multiply multiples of powers of 10.

- **What is the rule for multiplying decimals by powers of 10?**

for each 0 in the number move the decimal point One place to the right if there is no decimal point in the number add one 0 instead.

- **Why does this rule work?**

this works because every time you times a number by 10 the digets move one place to the left in place value we use collems to demenstrate this.

Justifies the rule for multiplying by powers of 10.

Mathematics

Number – Power

Annotations

- *Can you prove that the rule works for any decimals?*

I can prove that the rule works by getting another student to select 20 random decimals and then a power of 10 to multiply it by.

- *What do you think might happen when you divide decimals by powers of 10?*

I think a simmular thing will happen but it will go the other way. So you would take away one 0 or move the decimal point 1 place to the left.

Demonstrates a thorough understanding of multiplying decimals by powers of 10 by applying it to division.

- *Is there a rule for dividing decimals by powers of 10?*

yes there is a rule for dividing decimals by powers of 10 the rule is that you move the decimal point one place to the left for each 0 in the number.

- *Can you prove that your rule works for any decimals?*

I can prove that my rule works by getting another student to select 20 random decimals and than a power fof 10 to devide it by.

- *How can you check if you are right?*

I could check if I am right by using a calculator, redo the sum or do the oppercit opperation.

Understands the use of technology to check calculations.

Mathematics

Year 6
Above Satisfactory

Number – How tall

Relevant parts of the achievement standard

By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media.

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Summary of task

Students had completed a unit of work on decimals and their connection to the metric system. They had solved problems involving length and area using decimals. Students were asked to use their reasoning skills combined with their mathematical knowledge to solve several problems. They were given one lesson to complete the task as an assessment at the end if the unit.

Mathematics

Number – How tall

Year 6 Mathematics Task 3

Annotations

Measurement and Geometry

Task 3 (a)

Rachel is taller than 140 cm and shorter than 150 cm.

Daniel is 22 cm taller than Rachel.
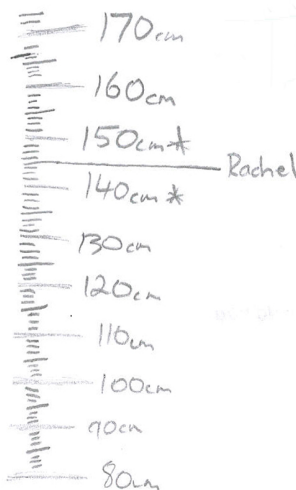
Adam is 5 ½ cm shorter than Daniel.

How tall could each of the three friends be in metres?

R 140 — 150
D +22
A − 5.5

Rachel — 1.45 m
Daniel — 1.67 m
Adam — 1.615 m

170 cm
160 cm
150 cm ✱
140 cm ✱ — Rachel
130 cm
120 cm
110 cm
100 cm
90 cm
80 cm

Calculates answer based on given information.

Calculates height in metres after considering given information.

- *Are there any other possibilities?*

Yes! Because Rachel could be anywhere from 140 − 150 cm, there could be many different answers. e.g

R	1.41 m	1.415 m	1.42 m
D	1.63 m	1.635 m	1.64 m
A	1.575	1.58	1.585 m

ect.

Calculates all possibilities by demonstrating the rule.

Mathematics

Number – How tall

Annotations

Task 3(b)

The area of a rectangle is 30.75 cm².

What could the side lengths be?

10.25×3

- *Are there any other possibilities?*

30.75×1

15.375×2

6.15×5

etc

Calculates four sets of possible dimensions of a rectangle from a given answer.

- *How do you know you are right?*

Because I found the factors of 30.75 cm²
from there I answered the question.

Demonstrates an application of a mathematical strategy to solve a problem.

Mathematics

Number – Abstract design

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on equivalent fractions, decimals and percentages. Students were asked to create an abstract design, dividing it into percentage parts and demonstrating a connection with fractions and decimals. Questions were written for the students to help them direct their mathematical thinking.
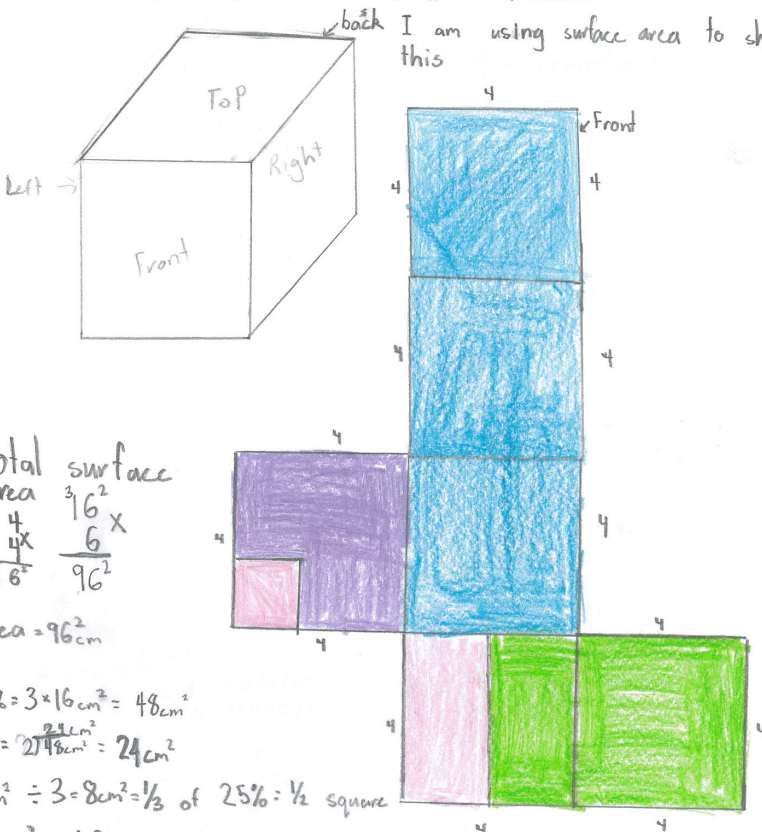
Mathematics

Number – Abstract design

Annotations

Can you create an abstract design that is 50% blue, 25% green, 15% purple and 10% pink?

What shape might be best for your design?
Can you express your percentages as fractions and decimals?
How do you know that you are right?
Can you try and design another mural using a different shaped canvas?

back I am using surface area to show this

Top

Left →   Right

Front

Front

total surface area

$\frac{3}{4}6^2 \times$
$4 \times$ 6
16^2 96^2

area = 96^2_{cm}

$50\% = 3 \times 16cm^2 = 48cm^2$
$25\% = 2\frac{24cm^2}{48cm^2} = 24cm^2$
$24cm^2 \div 3 = 8cm^2 = \frac{1}{3}$ of $25\% = \frac{1}{2}$ square
$96cm^2 \div 10 = 9.6cm^2, r 14.4$

$24cm^2 - 9.6 = r14.4$
$14.4cm^2 = 15\%$

Calculates the surface area of a cube.

Uses calculations to accurately divide a net into percentages.

Calculates the area of each percentage in a net.

Uses appropriate units to make calculations.

Uses equations to justify and solve problems.

Mathematics

Number – My number line

Relevant parts of the achievement standard

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Summary of task

Students completed a unit of work on fractions, decimals, percentages and their connection and positive and negative numbers in every day contexts.

Students were given two tasks at the culmination of the unit to assess their understanding. The students were also asked to reflect on fractions and to explain how to calculate a fraction of a quantity.

Mathematics

Number – My number line

$$\frac{1200}{23}$$

Select 2 fractions with different denominators and a numerator which is greater than 1.
(Eg. ⅔ and ⅘)
Which is larger?

How can you prove you are right?
Can you rename any of your fractions as decimals and/or percentages?

Repeat a number of times.
Can you order all of your fractions, decimals and percentages on a number line?

$\frac{5}{15}$ $\frac{8}{16}$ or $\frac{1}{3}$ $\frac{1}{2}$ Eight Sixteenths is larger. I know this because when I simplify both fractions they are One Third and One Half, One Half is larger than One third so there for Eight Sixteenths is the answer.

$\frac{8}{16}$ is the same as 50% and the same as 0.5

$\frac{5}{15}$ is the same as 33.3% and the same as 0.3̇

$\frac{17}{23}$ $\frac{12}{25}$ or 73.91% and 48%

Seventeen over Twenty Three is bigger because the percentage was larger

$\frac{12}{25}$ or 48% or 0.48 $\frac{17}{23}$ or 73.91%.

Annotations

Compares fractions with unrelated denominators by simplifying.

Explains how simplifying can be used in comparing fractions using mathematical language.

Represents fractions as a percentage and decimal.

Mathematics

Number – My number line

Annotations

Select 3 positive integers and 3 negative integers and place them all on a number line.
Can you use <, > and = to create some true sentences using some of your integers?
(Eg. 3 > -2)

How do you know where to place your numbers on the number line?
Why does 0 hold a place on a number line?
When do we use negative integers in real life? Can you describe what some of these mean?

$2, 4, 8 \qquad -9, -6, -7$

$-9 < 2 \qquad 8 > -6 \qquad 0 > -1 \qquad -10 > 10$

$4 - 6 = -2 \qquad 7 - 10 = -3 \qquad 2 - 8 = -6$

$1 - 9 = -8 \qquad 4 - 8 = -4 \qquad 5 - 9 = -4$

I knew where to place my numbers on my number line because I found the middle of my number line and put 0 down and then wrote positive numbers up to 7h right and negative numbers backwards to the left. This is how I knew where to put my numbers on the number line.

The 0 holds a place on the number line because it seperates the positive and the negitive numbers because it is right in the middle of the two.

We use negitive numbers integers in real life when we are mabye say using the bank if you are -$83 you owe money to the bank. You could be referring to the temperture

Identifies positive and negative integers.

Identifies positive integers being bigger than negative integers.

Records number sentences using mathematical symbols with positive and negative integers.

Explains the place of 0 in a number line with positive and negative integers.

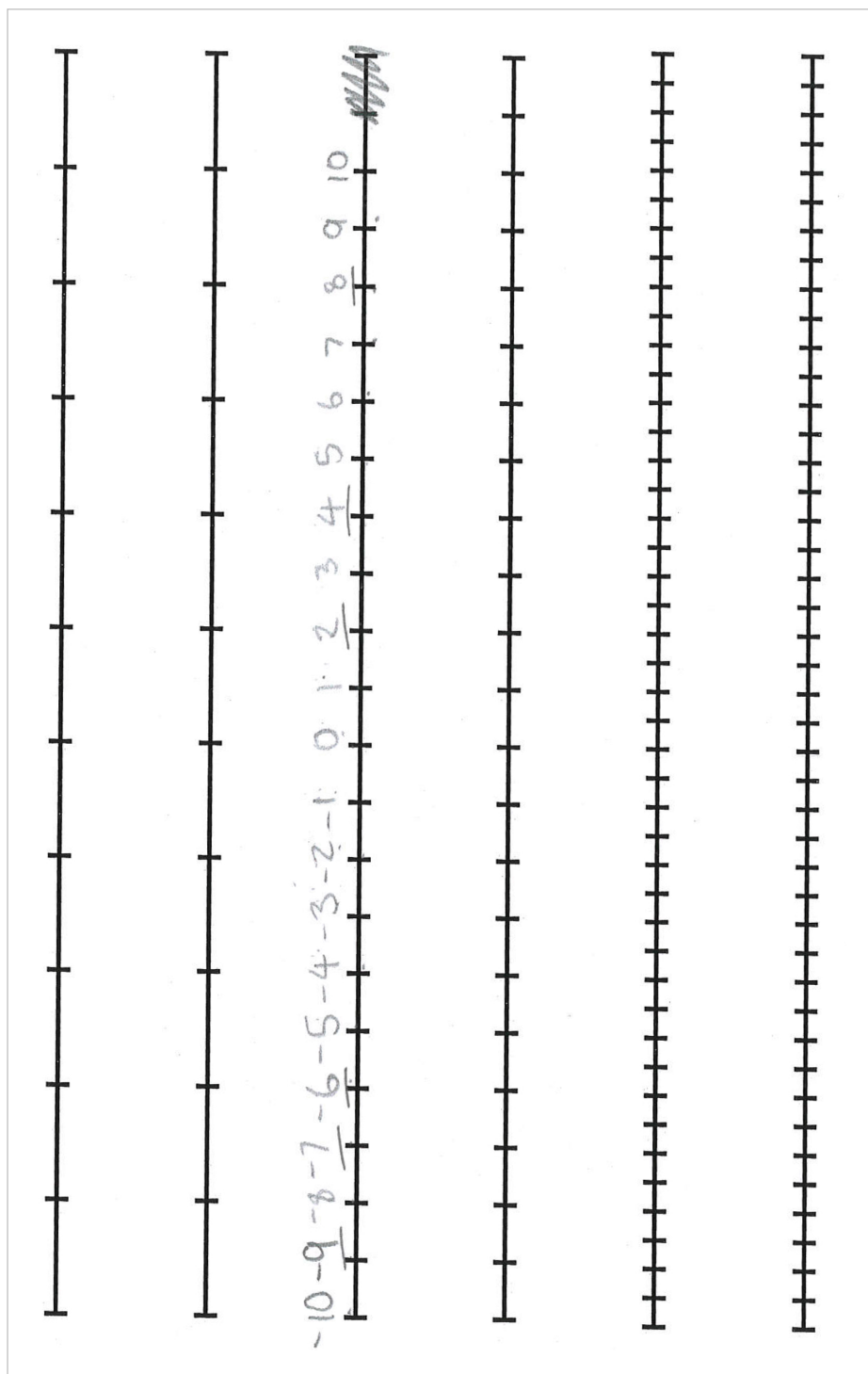*Describes everyday contexts where negative numbers are used.*

Mathematics

Number – My number line

Annotations

Constructs a number line with positive and negative numbers.

Mathematics

Number – Fifth term

Relevant parts of the achievement standard

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Summary of task

Throughout the term students had completed several units of work, one on the addition and subtraction of fractions with different denominators and another on creating and identifying patterns in number sequences. Students were given the following question as an assessment of concepts at the end of both units of work.

Kate created a subtraction pattern using fractions with different denominators.

If the fifth term in Kate's pattern was 1, what could her pattern look like?

The teacher asked the following questions to guide students through their thinking and working –

What is the rule for your pattern? How did you work it out? What other patterns can you create where 1 is the fifth term? Can you convert any of your fractions to decimals?

Mathematics

Number – Fifth term

1 | $4\frac{1}{3} - \frac{12}{18} = 3\frac{2}{3}$

2 | $3\frac{2}{3} - \frac{6}{9} = 3$

3 | $3 - \frac{18}{27} = 2\frac{1}{3}$

4 | $2\frac{1}{3} - \frac{6}{9} = 1\frac{2}{3}$

5 | $1\frac{2}{3} - \frac{12}{18} = 1$

6 | $1 - \frac{18}{27} = \frac{1}{3}$

7 | $\frac{1}{3} - \frac{6}{9} = -0.33$

8 | $0.33 - \frac{12}{18} = 0.99$

9 | $0.99 - \frac{18}{27} = -1.66$

10 | $-1.66 - \frac{6}{9} = 2.33$

$\frac{12}{18}$ is equal to $\frac{2}{3}$ because 18 is the product of 6 and 3 and 12 is the product of 6 and 2 therefore $\frac{12}{18}$ is equal to $\frac{2}{3}$

$\frac{18}{27}$ is equal to $\frac{2}{3}$ because 18 is the product of 2 and 9 and 27 is the product of 3 and 9 therefore $\frac{18}{27}$ is equal to $\frac{2}{3}$.

$\frac{6}{9}$ is equal to $\frac{2}{3}$ because 9 is the product of 3 and 3 and 6 is the product of 3 and 2. Therefore $\frac{6}{9}$ is equal to $\frac{2}{3}$

7–10 are written in decimals because negative numbers are easier to express and read in decimal form.

Annotations

Creates a more complex subtraction pattern using two equivalent fractions.

Explains strategies used to calculate solutions to the problem.

Justifies the use of decimals when calculating.

Demonstrates an understanding of negative numbers.

Mathematics

Geometry – Area

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on area of rectangles and compound shapes. The task was a mini assessment to guide next phase of teaching for the students for the unit of work. The students were required to calculate the area of rectangles and explain their thinking when calculating the area of a compound shape. The students were asked to complete the task in 20 minutes.
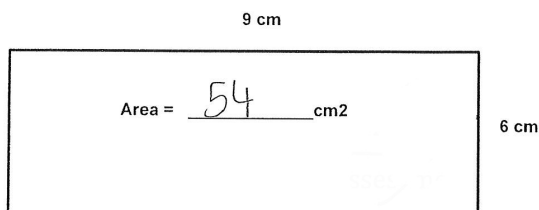
Mathematics

Geometry – Area

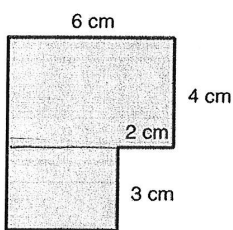3. Calculate the area of the following shapes.

a.

9 cm

Area = ___54___ cm2

6 cm

b.

6 cm

4 cm

2 cm

3 cm

Working Space.

6×4=24
3×3=9 ✗
       4
24+9=33

Explain how you solved the problem above.

firstly I made the compound shape into a square and a rectangle. Secondly I × the length by the width 6×4=24. Thirdly I did 3×3=9 I knew the width was 3 because a squares sides are all the same. lastly I added my answers together 24+9=33 and 33 would be the area.

Annotations

Calculates area of simple shapes.

Demonstrates understanding of calculating area of compound shapes.

Explains process in calculating the area of a compound shape.

Mathematics

Number – Calculations

Relevant parts of the achievement standard

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Summary of task

Students had completed several units of work involving problem solving of addition, subtraction, multiplication and division of whole numbers and decimals. Students on this occasion where given a formal pen and paper test that covered many of the concepts in the unit. They were required to estimate answers and demonstrate their thinking, using addition, subtraction, multiplication and division in single and multi-step problems.

Mathematics

Number – Calculations

Annotations

Solve these problems.

Addition

a.
$$^14\ 7\ .\ 2$$
$$+2\ 6\ .\ 0\ 7$$
$$7\ 3\ .\ 2\ 7$$

b.
$$^14^15\ .\ ^17\ 8$$
$$+3\ 6\ .\ 5\ 5$$
$$8\ 2\ .\ 3\ 3$$

Subtraction

a.
$$^34^12\ .\ 5$$
$$-3\ 4\ .\ 4$$
$$8\ .\ 1$$

b.
$$8\ ^56\ .\ ^12$$
$$-3\ 4\ .\ 6$$
$$5\ 1\ .\ 6$$

Multiplication

a.
$$^23\ .\ 7$$
$$X\quad 4$$
$$14\ .\ 8$$

b.
$$^2 2\ ^3 4\ .\ 5$$
$$x\quad 6$$
$$1\ 4\ 7\ .\ 0$$

Division

a. $8\ \overline{)8\ 5\ .\ 6}$ quotient $1\ 0\ .\ 7$

b. $5\ \overline{)4\ 7\ .\ ^20}$ quotient $0\ 9\ .\ 4$

Uses knowledge of power of 10 to multiply and divide decimals.

Calculates division problems of decimals using whole numbers.

Calculates multiplication problems of decimals with whole numbers.

Calculates addition and subtraction problems with decimals.

Multiply these decimals by 10, 100 and 1000. Estimate first.

	×10	×100	×1000
0.5	5	50	500
0.25	2.5	25	250
0.37	3.7	37	370
1.2	12	120	1200
7.34	73.4	734	7340

Divide these numbers by 10, 100 and 1000. Estimate first.

	÷10	÷100	÷1000
50	5	0.5	0.05
25	2.5	0.25	0.025
37.2	3.72	0.372	0.0372
48.5	4.85	0.485	0.0485
542	54.2	5.42	0.542

Mathematics

Number – Calculations

Annotations

For the following operations you are required to complete three steps.

1. Estimate an answer and explain how you arrived at your estimate.
2. Calculate an answer.
3. Comment on whether your answer appears reasonable.

Addition

a.

1 cola	$2.80
1 lime milkshake	$3.25
4 dim sims	$4.80
3 crab cakes	$2.60
Total	13.45

My estimate is $13

How did you get your estimate?

because I used the 'frontline' strategy, and ajusted my answer up a bit because 3 of the numbers would round up, and 2+3+4+2=11. so I estimated $13.

Is your answer reasonable? Explain

Yes, I believe my answer is reasonable because there is a fraction of difference between my estimate and my answer (45c to be exact).

Provides estimations when calculating with decimals.

Describes strategies used in estimating the calculation of decimals.

Calculates the addition of numerous decimals.

Compares estimations and calculated answers to check reasonableness of answers.

Subtraction

b. What is the difference between 3.4 and 7.171?

$$\begin{array}{r} 7.171 \\ -\ 3.400 \\ \hline 3.771 \end{array}$$

My estimate is 3.5

How did you get your estimate?

I looked logically at the problem and saw 7-3, which is 4, but in the tenths collum the top number is lower than the bottom, so I'd have to 'borrow'.

Is your answer reasonable? Explain.

Yes, my answer is reasonable because between my estimate and my answer, there is a minimal difference of .271, so I believe my answer is reasonable

Uses a range of strategies suitable to the operation to estimate calculation of decimals.

Mathematics

Number – Calculations

Annotations

c. Multiplication

$$\overset{6\ \ 5\ \ 3}{1\ 8\ .\ 7\ 5}$$
$$\times\qquad 7$$
$$\overline{1\ 3\ 1\ .\ 2\ 5}$$

My estimate is 135

How did you get your estimate?

because I rounded 18.75 to 20, and 20 × 7 = 140, but I adjusted my answer down because I rounded up, so 140 would be too high.

Is your answer reasonable? Explain.

Yes, I do think my answer is reasonable since the marginal difference between the two numbers is only approximately 4.

Divides a four digit number by a single digit number.

d. Division

$$\overset{0\ \ 2\ 5\ 8\ .\ 7\ 5}{8\ \overline{\smash{\big)}\ 2\ 0^{4}7\ 70\ ^{6}0\ ^{4}0}}$$

My estimate is 269

How did you get your estimate?

I got this by thinking that 8 goes into '2000' 250 times, and it goes into 70 just under nine times, so I rounded the last digit (the 'ones' digit) to 9.

Is your answer reasonable? Explain.

I believe my answer is reasonable because the difference between the two numbers is a quarter of a whole number, or .25.

Justifies estimation by explaining appropriate mathematical thinking.

Multiplys decimals by a single digit.

Estimates and explains mathematical thinking.

Mathematics

Number – Calculations

PART B: APPLICATION

You and your friends are going to the movies and it's your shout. Look at the price list below and use a multiplication strategy of your choice to answer the following questions. Show your thinking:

a How much will it cost you for 4 "Under 13" tickets?

$(10 \times 4 = 40) + (.50 \times 4) = \$42$

$\$42$

Ticket prices

Under 13	$10.50
Adult	$14.50

Refreshments

Popcorn	S	$2.50
	M	$3.50
	L	$4.50
Drink	S	$2.50
	M	$3.00
	L	$3.50
Chocolate bar		$1.95
Choc top		$3.25
Water		$1.95
Chips/Crisps		$2.95

b Two of your friends each want a large drink and a medium popcorn. What will that cost you?

$3.50 \times 4 = \$14.00$

$\$14.00$

c You and your other friend want a choc top and a large drink each. What will that cost?

$(3.50 \times 2) + (3.25 \times 2) = \$13.50$

$\$13.50$

d Halfway through the movie, you are all dying of thirst and you go out and buy 4 bottles of water. You pay for them with a $20 note. How much change do you receive?

$1.95 \times 4 = \$7.80$

$\$20.00 - 7.80 = 12.20$

$\$12.20$

Annotations

Records calculations.

Solves everyday multiplication problems involving decimals.

Records number sentences using brackets and calculates answer using order of operations.

Solves problems requiring multiple steps and operations.

Mathematics

Geometry – 3D structure

Relevant parts of the achievement standard

By the end of Year 6, students recognise the properties of prime, composite, square and triangular numbers. They describe the use of integers in everyday contexts. They solve problems involving all four operations with whole numbers. Students connect fractions, decimals and percentages as different representations of the same number. They solve problems involving the addition and subtraction of related fractions. Students make connections between the powers of 10 and the multiplication and division of decimals. They describe rules used in sequences involving whole numbers, fractions and decimals. Students connect decimal representations to the metric system and choose appropriate units of measurement to perform a calculation. They make connections between capacity and volume. They solve problems involving length and area. They interpret timetables. Students describe combinations of transformations. They solve problems using the properties of angles. Students compare observed and expected frequencies. They interpret and compare a variety of data displays including those displays for two categorical variables. They evaluate secondary data displayed in the media.

Students locate fractions and integers on a number line. They calculate a simple fraction of a quantity. They add, subtract and multiply decimals and divide decimals where the result is rational. Students calculate common percentage discounts on sale items. They write correct number sentences using brackets and order of operations. Students locate an ordered pair in any one of the four quadrants on the Cartesian plane. They construct simple prisms and pyramids. Students list and communicate probabilities using simple fractions, decimals and percentages.

Summary of task

Students had completed a unit of work on shape that involved constructing nets, three-dimensional shapes and identifying two-dimensional shapes within a three-dimensional shape. The task was given to the students a week after they had finished the unit of work to assess their knowledge of three-dimensional shapes. Students were asked to construct the net of a prism and a pyramid and create the object using straws. This task took several class lessons to complete.
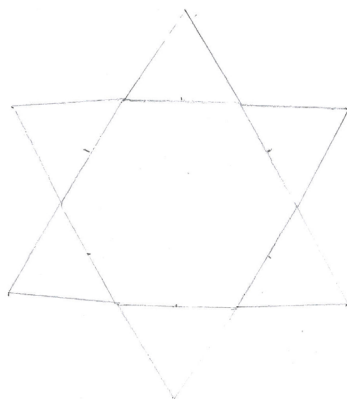
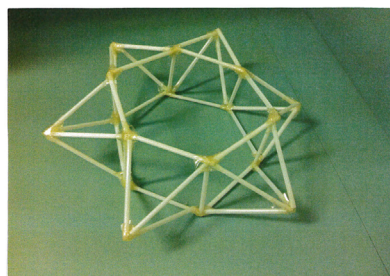# Mathematics

Geometry – 3D structure

Design and build a three dimensional structure

Design your structure here

1x hexagonal prism.
6x square based pyramids.

Add a photo of your completed structure here

Describe the design features of your structure here

I made a star using 9.75cm straws
to make one hexagonal prism and six
square based pyramids.
My shape can be used as a big christmas
tree decoration.

Annotations

Identifies the three-dimensional shapes required in plan.

Constructs a complex three-dimensional shape using a prism and pyramids.

Designs a plan to construct a three-dimensional object.

Accurately measures length of straws.

Identifies uses for the three-dimensional object.

Mathematics

Number – Percentages

Relevant parts of the achievement standard

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Summary of task

Students had completed several units of work on fractions, decimals and percentages. One component was to calculate percentages of whole numbers, typically using shopping items on sale. Students were given the task to complete during a class lesson.

Mathematics

Number – Percentages

6. Explain how you would calculate 20% of 250.

I method

1. $20 = \frac{1}{5}$, $250 \div 5 = 50$

2. $20 = \frac{2}{10}$, $250 \div 10 \times 2 = 50$

3. $20 = \frac{20}{100}$, $250 \div 100 \times 20 = 50$

7. Calculate the discounted prices for these items.

a 10% off $300	b 25% off $200	c 75% off $120	d 20% off $50	e 50% off $60
$ 270	$ 150	$ 30	$ 40	$ 30

$4\overline{)120}$ remainder 30

$30 \times 3 = 90$

$120 - 90 = 30$

Annotations

Explains how to calculate a common percentage of a quantity by creating three examples.

Calculates the amount of sale discount using common percentages.

Shows mathematical working to calculate the new price of an item with the percentage discount.

Mathematics

Geometry – Sam's square

Relevant parts of the achievement standard

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Summary of task

Students had completed a unit of work on integers and coordinates. At the end of the unit they were given the task to complete during one class lesson.

Teacher questioning with task :

Are there other possibilities?
Is there a pattern in your answers?
How will you record your responses?
What if he created other types of quadrilaterals? What would the coordinates be?
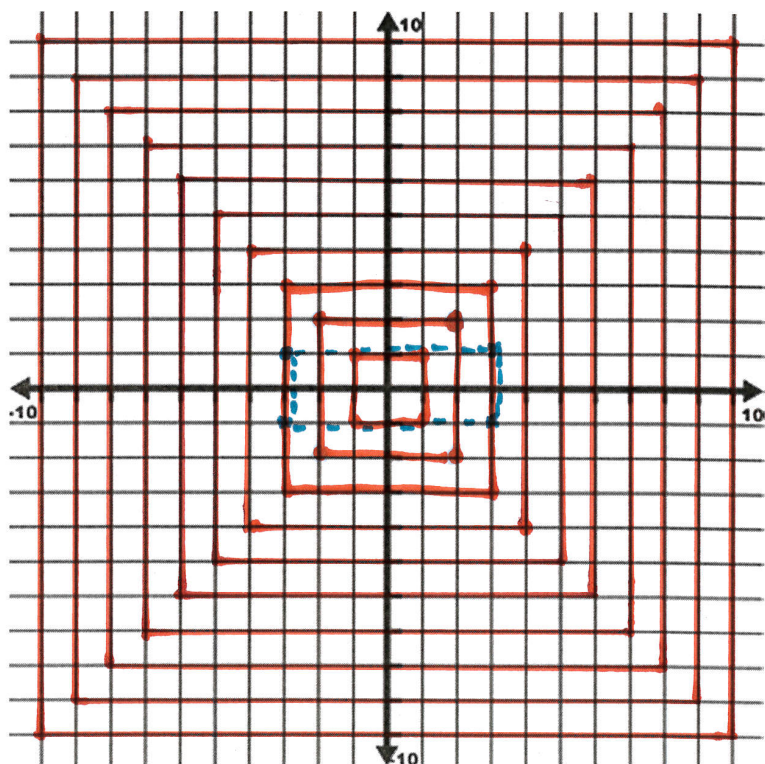
Mathematics

Geometry – Sam's square

Sam plotted one point in each quadrant of a Cartesian plane. When he drew lines joining the points, they formed a square. What could the coordinates be?

The first square is (1,1)(1,-1)(-1,1)(-1,-1) then you can relate square numbers thinking. So there is a pattern you increase the number by one on each axis and the coordinates all have to be the same.
Other quadrilaterals can be plotted my rectangle is (3,1)(3,-1)(-3,1) (-3,-1).

Annotations

Calculates the coordinates for a square on the Cartesian plane.

Relates mathematical knowledge to explain the pattern.

Plots a rectangle on a Cartesian plane.

Plots squares on a Cartesian plane.

Mathematics

Probability / statistics – Spinner mania

Relevant parts of the achievement standard

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Summary of task

Students had completed lessons on relating probability to fractions, decimals and percentages so they could predict a mathematical chance of an event occurring.

Students had to create a spinner with colours that would give an unfair chance of colours occurring when spun. They had to calculate the mathematical chance of colours being spun and then spin the spinner a number of times and record the actual times colours were spun. Students were asked to graph the expected and actual results and then compare and explain the results.
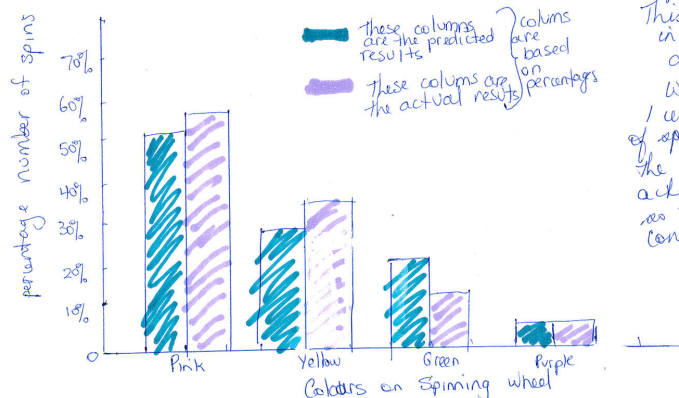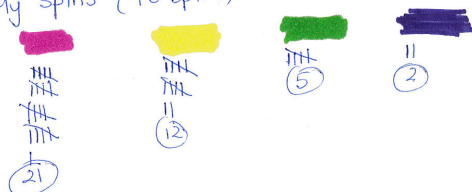
Mathematics

Probability / statistics – Spinner mania

Annotations

Describes probability using percentages.

Connects percentages, fractions and decimals.

Calculates a percentage and decimal from the results of a chance event.

Uses tally marks to record results of chance event.

Explains the results of compared expected frequencies with observed frequencies.

Draws a graph to show comparison of percentage results.

Mathematics

Probability / statistics – Spinner mania

Annotations