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 4 MATHEMATICS

This portfolio provides the following student work samples:

Sample 1 Number: Lucy’s birthday
Sample 2 Number: Multiplication
Sample 3 Measurement: 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: Time word problems
Sample 10 Number: Sausage sizzle
Sample 11 Statistics: Data
Sample 12 Statistics and probability: One minute challenge
Sample 13 Geometry: Angles
This portfolio of student work shows the drawing of different quadrilaterals with the same area (WS3). The student applies 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 adds consecutive numbers to demonstrate understanding of odd and even numbers (WS4). The student creates four-sided shapes with and without symmetry (WS6) and uses strategies to solve time word problems (WS9). The student constructs addition and subtraction number sentences to solve written problems (WS7) and identifies equivalent fractions and decimals, locates them on a number line and represents them pictorially (WS8). The student uses knowledge of multiplication and decimals to solve and justify their solution of a financial problem (WS10) and uses reasoning to ask the best question to collect data in a table and create a data display (WS11). The student identifies the likelihood of events occurring and identifies whether or not events are affected by each other (WS12). The student identifies angles found in the environment (WS13).
Number: Lucy’s birthday

Year 4 Mathematics achievement standard

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

**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?
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.

11 - because 2 rows of 5 is 10 r 1
3 rows of 3 = 9 r 2

23 - because 2 rows of 11 = 22 r 1
3 rows of 7 = 21 r 2

So Lucy could be 11 or 23
There could be more numbers
Number: Multiplication

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Students use the properties of odd and even numbers. They recall multiplication facts to $10 \times 10$ 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 formed when looking at number sequences involving multiplication. Students were given this task to complete in a half-hour time period in class.
Number: Multiplication

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

My rule is $3 \times$

3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36, 39, 42, 45, 48, 51, 54, 57, 60

This is the 20th term.

These are some of the numbers that would definitely be in the 3x table pattern. 90 because 30 is the tenth term and if you times that by 3 you get 90.

I knew that 90 was in it so you would be able to have 2 90s in it which $90 + 90 = 180$, would add up to. If 180 is in it $180 \div 3 = 60$ would be in it which

$\frac{180 \times 360}{3} = 1080$
Number: Multiplication

Annotations

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.
Measurement: Quadrilaterals

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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.
Measurement: Quadrilaterals

Annotations

Determines the area of the irregular shape.

Draws a number of rectangles that have the same area as the irregular shape.

Draws a parallelogram that has the same area as the irregular shape.
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 Year 4
Satisfactory
2014 Edition

Number: Odd and even

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

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.
Number: Bingo

Year 4 Mathematics 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.
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.

<table>
<thead>
<tr>
<th></th>
<th>16</th>
<th>45</th>
<th>8</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>6</td>
<td>8</td>
<td>40</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>12</td>
<td>18</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>20</td>
<td>6</td>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

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 appears 4 times on a 10x10 grid. 15 is on my grid because it appears 3 times. Another number I put on is 6 because it appears 3 times.

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

I didn’t choose 100 because it only appears once on a 10x10 grid. I didn’t want to have 13 on my grid because it doesn’t appear once on the 10x10 grid.

Annotations

Selects mostly products that occur relatively frequently in the multiplication facts up to 10 × 10.

Demonstrates some knowledge of which products occur more frequently in the multiplication facts up to 10 × 10.

Explains why particular numbers were not chosen by identifying one of the products that occurs least frequently in the multiplication facts up to 10 × 10 and also by excluding a number that is not the result of a multiplication fact up to 10 × 10.
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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.
Geometry: Symmetry

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

Annotions

Draws shapes with symmetry.

Identifies lines of symmetry of a shape.

Creates a shape and identifies the line of symmetry.
Geometry: Symmetry

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

Annotations

- Describes why a shape is not symmetrical.
- Creates asymmetrical shapes.
- Makes generalisations about the features of asymmetrical shapes.
Number: Sentences

Year 4 Mathematics 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.
Number: Sentences

Annotations

Uses tables to collect the information needed to solve the problems.

Solves written problem using a subtraction number sentence.

Solves written problems using addition number sentences.
Number: Sentences

The problem

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?

<table>
<thead>
<tr>
<th>Representations</th>
<th>Calculator number sentence. Include your answer.</th>
</tr>
</thead>
<tbody>
<tr>
<td>9, 25, 16</td>
<td>9 + 16 = 25</td>
</tr>
<tr>
<td>14, ?</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td></td>
</tr>
</tbody>
</table>

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

| 12, 13, ?       |                              |
| 18, 18, 38, 28, 18-18, 18, 18, ? | 18, 38 |

Annotations

Writes a problem and calculates the answer from given information.
Number: Fractions and decimals

Year 4 Mathematics achievement standard

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Summary of task

Students had completed a unit of work on fractions, looking at halves, quarters, thirds, fifths, sixths, eighths and tenths 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.
Number: Fractions and decimals

Annotations

- Creates a pictorial representation of the fraction.
- States equivalent fractions.
- Writes equivalent fractions in words.
- Writes the fraction in decimal form.
- Identifies where fractions can be seen in everyday life.
Mathematics

Number: Fractions and decimals

Annotations

Locates equivalent fractions and decimals on a number line.
Measurement: Time word problems

Year 4 Mathematics achievement standard

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Summary of task

The students had completed two units of work on time during the year, including calculating the duration of events using start and finish times and converting between units of time, such as from hours to minutes. There had also been a focus on problem-solving using different techniques, including explicit teaching of the empty number line.

The students were given the problem-solving tasks as a class and the teacher read through the problems, clarifying any questions related to meaning. The students then completed the work individually as a formal assessment task.
Measurement: Time word problems

Annotations

Converts time measurements into the same units to allow for comparison and to justify their answer.

Uses an additive strategy to convert between units of time.

Solves a time problem by working backwards from a given time on an empty number line.

Uses an empty number line to calculate time duration.

Converts from minutes to seconds.
Measurement: Time word problems

You are going on a holiday to Fiji. You arrive in Fiji at 3:20pm (Australian Time). If the flight from Australia takes 5 hours and 5 minutes, what time did you take off from Australia?

I took off at
10:15 am
10:20 am
3:20 pm

You play for 30 hours a week. List some possible times for your play routine.
How many minutes in a week do you spend not playing?
1 hour at school = 5 hours
1 hours at home on school days = 5 hours
10 hours at home on weekends = 20 hour
30 hours altogether

Add up the total amount of sleep you get each week. Predict how much sleep you will get tomorrow night and why?

Mon – Fri: 8:30 – 7:30 am
Sat – Sun: 10:00 – 7:30 am

on the weekdays I get 11 hours sleep.
on the weekends I get 9 hours and 30 minutes.

Write a time problem that involves the following times 8:00 am, 1 hour 20 min
It is 8:00 and my brother needs to get to football; he will have to get there in 1 and 20 minute. What time will he arrive?

Annotations

Applies an appropriate strategy to work backwards from a given time.

Interprets and uses am and pm notation when solving a time problem.

Lists appropriate time durations for play each day.

Calculates the amount of sleep on each day of the week, recognising that the amount of sleep varies depending on whether it is a weekday or a weekend day.

Creates a simple time problem using the information given in the question itself.
Number: Sausage sizzle

Year 4 Mathematics achievement standard

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Summary of task

A unit on money and financial mathematics linking with number, fractions and decimals was taught for two weeks. The Australian Securities and Investments Commission (ASIC) Helping Out Teaching Resource (http://teaching.moneysmart.gov.au/mst-digital-resources/helping-out/index.html#start) was used as a teaching tool. The assessment task was adapted from the ASIC Helping Out game. The students played the game a number of times during the unit.

Students were given one hour to complete the assessment task individually, under examination conditions at the end of the unit.
Number: Sausage sizzle

Sausage Sizzle Fundraiser

Part A:
Your Principal has asked for your help to organise the end of term BBQ fundraiser. You can borrow up to $400 from the school to start up the fundraiser, however, it needs to be paid back.

-400 students in the school
-400 rolls cost $2.50 each
-400 sausages cost $5 per kilo (10 sausages)
-Tomato sauce will cost $4.55 per bottle (40 serves)

Budget: How much will it cost?

<table>
<thead>
<tr>
<th></th>
<th>Rolls</th>
<th>Sauce</th>
</tr>
</thead>
<tbody>
<tr>
<td>400 rolls</td>
<td>1000</td>
<td>400</td>
</tr>
<tr>
<td>$2.50 each</td>
<td>$0.45</td>
<td>$4.55</td>
</tr>
<tr>
<td></td>
<td>$22.50</td>
<td>$182.00</td>
</tr>
</tbody>
</table>

Total Cost: $222.50

Price of Sausages: Explain Why?

I would make it $2.50 because there will be enough money.

Income: What is the total amount of money you will collect after selling all the sausages?

$2000

Profit: How much money can you make?

Remember your need to pay back the start up cost:

$322.75

Uses algorithms to perform calculations involving the multiplication of whole numbers.

Converts the result of a multiplication in cents into dollars.

Uses an algorithm to multiply a decimal by a whole number.

Justifies the pricing of an item.

Calculates expected income from sales.

Calculates expected profit from sales.

Adapted from ASIC's MoneySmart Teaching Digital Resource:
teaching-resources/asic-helping-out?page=2&y=0&la=0&a=0&rt=146
Mathematics

Number: Sausage sizzle

Helping Out

Part B:
Some of your profit needs to be donated to Papua New Guinea to assist their schools.
1AUD= 2.5PGK

How much PGK are you going to donate? Show your working.

500.00
1000.00
1250.00
250.00
375.00
750.00
1250.00

What will you buy with your PGK?

Dessert: 30 PGK
Chairs: 20 PGK
Exercise books: 2 PGK

I will buy 255 books, 8 lots of 15, and have no left over.

1250 x 2.5
3125.00
300.00
180.00
680.00
570.00

Annotations

Converts from one currency to another using multiplication.

Uses algorithms to perform calculations involving multiplication.

Uses trial and error in an attempt to determine an appropriate quantity for each item given the amount of money available.

Adapted from ASIC's MoneySmart Teaching Digital Resource:
http://teaching.moneysmart.gov.au/resource-centre/teaching-resources/asic-helping-out?page=2&amp;x=0&amp;y=0&amp;jsa=0&amp;capa=0&amp;rt=146
Statistics: Data

Year 4 Mathematics achievement standard

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Summary of task

Students had completed a unit of work on collecting, representing and displaying data. This task was given to them as a task over several mathematics lessons as an end-of-unit assessment.

Students had to reflect on the best way to ask a question to collect and present data. They were asked to predict the responses, collect the data and construct a data display with the information collected.
## Statistics: Data

### Data Assessment Task Part 1

Name:  
Date:  

4 Green are planning a special class lunch and their teacher needs to know the most popular fast food amongst the students. The teacher has decided to survey the students.  

View the two survey questions below and circle the question that will best provide the teacher with the data he/she needs.  

Explain why you believe that question to be best.  

**What is your favourite fast food?**  

- [X] McDonald’s  
- [ ] KFC  
- [ ] Fish And Chips  
- [ ] Pizza Hut  
- [ ] I Don’t Like Fast Food  

I chose this because:  

*Because it would be easier instead of lots of different answers.*

### Annotations

- Selects an effective question to collect data.  
- Explains why a particular type of question is more efficient when collecting data.
Mathematics

Statistics: Data

Data Assessment Task Part 2

Predict the total number of given devices that Year 4 students have in their homes.

<table>
<thead>
<tr>
<th>Devices</th>
<th>Number Of Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>iPad</td>
<td>19</td>
</tr>
<tr>
<td>Mini iPad</td>
<td>5</td>
</tr>
<tr>
<td>Mobile Phone</td>
<td>52</td>
</tr>
<tr>
<td>Tablet</td>
<td>4</td>
</tr>
<tr>
<td>Laptop Computer</td>
<td>16</td>
</tr>
<tr>
<td>Desktop Computer</td>
<td>27</td>
</tr>
<tr>
<td>Gaming Device</td>
<td>16</td>
</tr>
<tr>
<td>TOTAL NUMBER OF DEVICES</td>
<td>154</td>
</tr>
</tbody>
</table>

Record in the table below the actual number of given devices that Year 4 students have in their homes:

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>iPad</td>
<td>28</td>
</tr>
<tr>
<td>Mini iPad</td>
<td>7</td>
</tr>
<tr>
<td>Mobile Phone</td>
<td>69</td>
</tr>
<tr>
<td>Tablet</td>
<td>13</td>
</tr>
<tr>
<td>Laptop Computer</td>
<td>54</td>
</tr>
<tr>
<td>Desktop Computer</td>
<td>23</td>
</tr>
<tr>
<td>Gaming Device</td>
<td>68</td>
</tr>
<tr>
<td>TOTAL NUMBER OF DEVICES</td>
<td></td>
</tr>
</tbody>
</table>

Annotations

Makes predictions in investigations.

Records data from a survey.
Statistics: Data

Annotations

Selects and constructs a column graph to represent the data collected.

Chooses an appropriate scale and labels increments evenly on the vertical axis.

Selects and uses appropriate labels for the axes.
Statistics: Data

Data Assessment Task Part 3
Using your collated data create a visual representation that you believe most effectively displays the data.
You may choose either:
1. column graph
2. picture graph
3. electronically created graph

Data Assessment Task Part 4
Write a justification statement to support your choice of visual representation. Remember to also justify why you didn’t choose an alternate visual representation.

I chose the column graph because it was easiest to read.

Annotations
Justifies the selection of a column graph by referring to ease of interpretation.
Statistics and probability: One minute challenge

Year 4 Mathematics achievement standard

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

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

The students had completed work on the topic of chance twice during the year. They had participated in activities using dice, coins and spinners and had predicted the chance of events occurring and identified events that can’t happen at the same time.

This assessment was given after the second series of lessons. Students were asked to independently complete a series of tasks related to chance.
Statistics and probability: One minute challenge

Annotations

Records the results of repeated trials in a chance experiment.

Identifies the outcome with the highest frequency in a chance experiment.

Recognises when the results of previous trials in a particular chance experiment do not affect the results of subsequent trials and provides an explanation.

Creates chance statements with different likelihoods to the given statements.

Orders events from least likely to most likely to occur.
Statistics and probability: One minute challenge

Why can’t this happen?

Consider the following events, what event cannot happen if other does:

If the sun is rising it cannot _______ be right time ________ at the same time.
If it is dry it cannot _______ wet _______ at the same time.
If I roll a 5 in a six sided die I cannot _______ roll a 1, 2, 3, 4, 6 _______ at the same time.
Create 2 of your own events where one cannot happen if the other happens.

If it is raining it cannot be sunny:
When your asleep you can’t be awake.

Annotations

Identifies events that cannot happen at the same time as particular given events.

Describes pairs of everyday events that cannot happen at the same time as each other.
Geometry: Angles

Year 4 Mathematics achievement standard

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

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

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