## 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
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 $10 \times 10$ (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).

## 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:

- interpret information contained in maps
- describe different methods for data collection
- identify dependent and independent events
- classify angles in relation to a right angle
- list the probabilities of everyday events.


## 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 $10 \times 10$ 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 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



Acknowledgement
ACARA acknowledges the contribution of Australian teachers and education authorities in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

## Annotations

Shows a calculation that has two equal rows and leaves a remainder of one.

Shows a calculation that has three equal rows and has a remainder of two.

Draws a conclusion based on their calculations in order to solve a number sentence problem.

Gives one solution to the problem posed.

## Number - Multiplication

## 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 $10 \times 10$ 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?

$$
\begin{aligned}
& 40,41 \\
& \text { to workthis out I coded. } 5 \text { More } \\
& \begin{array}{l}
\text { terms already. } \\
\text { the number th }
\end{array}
\end{aligned}
$$

$$
\begin{aligned}
& \begin{array}{l}
\text { loo. tern and benares } 40 \text { tiny } \\
\text { be in number times is the }
\end{array} \\
& \begin{array}{l}
\text { be in the berg the it by } \\
\text { because } 4 \text { times is manx } \\
4 \text { every sound is zany }
\end{array} \\
& \begin{array}{l}
42 \text { is not in the } 400 \text { because }{ }^{2} \text { in to } \\
\text { and } 4000 \text { in the }
\end{array} \\
& \begin{array}{l}
\text { and is not in the } 4 \text { boo in because } 100 \times 40 \text { to } \\
\text { timer table }
\end{array} \\
& \text { mr times table is the } 6 \text { times }
\end{aligned}
$$

## Annotations

Creates a multiplication number pattern that includes the number 60.

Attempts to explain the pattern.

Attempts to justify terms in the sequence and terms not in the sequence.

## Geometry - Quadrilaterals

## 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 $10 \times 10$ 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 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.

## Geometry - Quadrilaterals



## Number - Odd and even

## 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 $10 \times 10$ 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 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.

## Number - Odd and even



## Annotations

Demonstrates an understanding of the meaning of consecutive numbers.

Calculates addition algorithm using partitioning.

Calculates one example of the addition of three consecutive numbers to give an odd answer.

Attempts to generalise the result.

Demonstrates simple understanding of odd and even numbers.

Demonstrates wider thinking of the concept.

## Number - Bingo

## 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 $10 \times 10$ 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 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 $4 \times 4$ 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.


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


- few r times.
$\qquad$
$\qquad$
Choose 2 numbers you didn't include on your grid and write why you didn't choose them.
lIve chosen 79 and 0 because they don't appear
once.
$\qquad$
$\qquad$


## Annotations

Identifies common products for multiplication facts.

Justifies reasons for choosing more common products.

Justifies why less common products were not chosen.

## Geometry - Symmetry

## 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 $10 \times 10$ 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 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



## Annotations

Identifies types of angles.
Draws shapes that are symmetrical.

Identifies lines of symmetry of shapes.

Describes why shapes are symmetrical.

## Geometry - Symmetry



## Annotations

Creates asymmetrical shapes.

## Number - Sentences

## 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 $10 \times 10$ 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 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

| 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 | Representa |  | Calculator number sentence. Include your answer |
| Peter has 14 cats eye marbles and 7 pearly marbles. How many marbles does he have altogether? | $14+7=21$ | $\begin{array}{\|l\|l\|} \hline 14 & 7 \\ \hline 2 & \\ \hline \end{array}$ | $14+7=12$ |
| 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? | ; | $\begin{array}{\|c\|c\|} \hline 17 \mathbb{H}_{1} 12 \\ \hline \end{array}$ | $17-12=5$ |
| The teddy bear weighs 25 grams. The toy car weighs 10 grams more than the teddy. How heavy is the car? |  | $\sqrt{\frac{25110}{35}}$ | $25+10=35$ |
| 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? |  |  | $2+21=29$ |
| 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? |  | $\begin{array}{\|l\|l\|} \hline 15 & 30 \\ \hline 45 \\ \hline \end{array}$ | $15+30=45$ |

Creates number sentences using addition and subtraction to

## Annotations

 solve a written problem.Acknowledgement
ACARA acknowledges the contribution of Australian teachers and education authorities in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

## Number - Sentences

## Annotations



## Number - Fractions and decimals

## 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 $10 \times 10$ 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 completed a unit of work on fractions looking at haves, 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.

## Number - Fractions and decimals



## Annotations

Identifies equivalent fractions.

Draws one pictorial representation of the fraction.

States the decimal equivalent of the fraction.

Draws $1 / 4$ of a collection.

Give a real life example where the
fraction could be used.

[^0]
## Mathematics

## Number - Fractions and decimals



## Annotations

## Measurement - Cinema timetable

## Relevant parts of the achievement standard


#### Abstract

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 $10 \times 10$ 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 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.

## Measurement - Cinema timetable

## 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 |
|  | $30^{\text {e }}$ | 100 min | the Lomin |
|  |  | 30 min | 2 hr 10 min |
|  | $10^{-10}$ | $86 \mathrm{~min}$ | lhr 26 min |

## Annotations

Represents time to the nearest minute on both analogue and digital clocks.

## Measurement - Cinema timetable

| Start time | Movie | Duration |  |
| :---: | :---: | :---: | :---: |
|  |  | Minutes | Hours and Minutes |
|  | $\sin ^{2} \operatorname{lar}_{3} \log ^{2}$ | Olymin | hr 34min |
|  | +in and | $85 \text { min }$ | Whr 24 min |
|  | $\begin{aligned} & r^{e} \text {. } \\ & \operatorname{sig}^{\circ} \\ & \operatorname{cog}^{\circ} \end{aligned}$ | $124 m i n$ | 2hr 4 min |
| PM | $W^{n^{e}}$ | 110 min | thr 50 min |
|  | $\text { aung } \operatorname{lig}^{e^{c}} e^{5}$ | $142 \min$ | $2 \text { hr } 22 m i$ |
| -1 1 |  |  |  |

## Annotations

Converts time from minutes to hours and minutes.

## Number - Giving change

## 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 $10 \times 10$ 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 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



Acknowledgement
ACARA acknowledges the contribution of Australian teachers and education authorities in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

## Annotations

Represents money amounts using the least possible number of coins.

Calculates change to the nearest five cents.

Rounds off money amounts to the incorrect five cents.
Solves written money problems.

## Statistics - Collect, display, interpret

## 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 $10 \times 10$ 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 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.

## Statistics - Collect, display, interpret



## Annotations

Represents data using a column graph.

Explains the data that the graph is showing.


[^0]:    Acknowledgement

