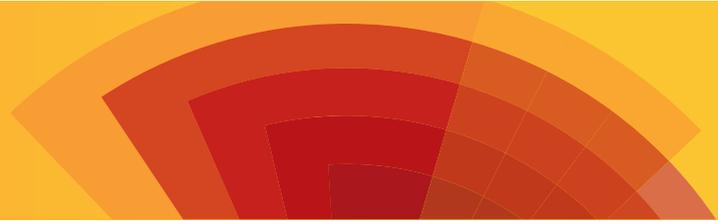


Mathematics



WORK SAMPLE PORTFOLIOS

These work sample portfolios have been designed to illustrate satisfactory achievement in the relevant aspects of the achievement standard.

The December 2011 work sample portfolios are a resource to support planning and implementation of the Foundation to Year 10 Australian Curriculum in English, Mathematics, Science and History during 2012. They comprise collections of different students' work annotated to highlight evidence of student learning of different aspects of the achievement standard.

The work samples vary in terms of how much time was available to complete the task or the degree of scaffolding provided by the teacher.

There is no pre-determined number of samples required in a portfolio nor are the work samples sequenced in any particular order. These initial work sample portfolios do not constitute a complete set of work samples - they provide evidence of most (but not necessarily all) aspects of the achievement standard.

As the Australian Curriculum in English, Mathematics, Science and History is implemented by schools in 2012, the work sample portfolios will be reviewed and enhanced by drawing on classroom practice and will reflect a more systematic collection of evidence from teaching and learning programs.

THIS PORTFOLIO – YEAR 3 MATHEMATICS

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

Sample 1	Numbers – Apple combinations
Sample 2	Location – Positions on maps
Sample 3	Chance – Removing counters
Sample 4	Location – Home to the park
Sample 5	Fractions – Representing fractions
Sample 6	Money and financial transactions – Shopping purchases
Sample 7	Data representations – Interpreting and comparing data displays
Sample 8	Clock face
Sample 9	Finding the odd number

Mathematics

This portfolio of work samples demonstrates the student's ability to calculate combinations to 10 for both addition and subtraction (WS1, WS9) and represent fractions for collections and whole objects (WS5). The student locates co-ordinates on a map, creates a map of a local area from a top perspective and records directions from one place to another using a compass (WS2, WS4). The student makes predictions for the likelihood of a number being drawn when two dice are rolled and added (WS3). The student creates addition and subtraction problems for money values and correctly calculates purchase price and change given for a collection of items (WS6). The student investigates, creates and presents data in the form of a column graph, pie chart and bar graph (WS3, WS7), determines and justifies the most appropriate presentation of the data and tells time on both analogue and digital clocks to the minute (WS8).

The following aspects of the achievement standard are not evident in this portfolio:

- *identify symmetry in the environment*
- *count to and from 10 000*
- *use metric units for length, mass and capacity*
- *make models of three-dimensional objects.*

Mathematics

Work sample 1: Numbers – Apple combinations

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

In this activity students recognised the connection between addition and subtraction.

Students were given ten counters and a work mat depicting two trees.

Students were presented with the following scenario:

‘Mrs Day had two apple trees in her backyard. On Monday she picked three apples. How many apples did she pick from each tree?’

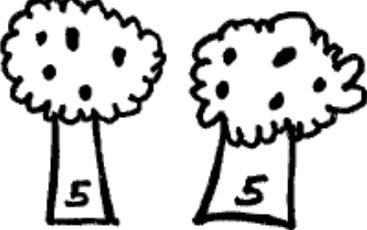
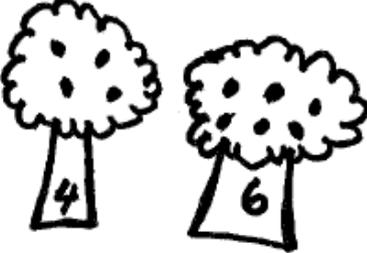
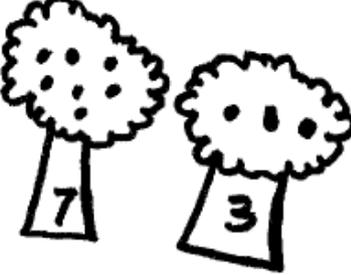
The teacher models the possible combinations for this problem:

- three apples from the left tree
- three apples from the right tree
- two apples from the left, one from the right, or
- two apples from the right, one from the left.

Students were asked to record the possible combinations if Mrs Day picked ten apples. Students were encouraged to use drawings, numerals and/or words in their recording.

Mathematics

Work sample 1: Numbers – Apple combinations

	$5 + 5 = 10$ $5 - 5 = 0$
	$4 + 6 = 10$
	$1 + 9 = 10$
	$7 + 3 = 10$ $7 - 4 = 3$

Annotations

Identifies and describes patterns when counting.

Represents number patterns using diagrams.

Acknowledgment

ACARA acknowledges the contribution of the NSW Department of Education and Communities for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 2: Location – Positions on maps

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

Students were required to create a map. They were asked to draw items at the set coordinates on the map. They provided instructions to find a hidden treasure.

Mathematics

Work sample 2: Location – Positions on maps

Draw these items at the following coordinates
 E1 - Boat D5 - Tree B3 --Rocks F7 - Skull G2 - Mark an X

Write your instructions for how to find the treasure

Start at the X Go UP 4. turn left 5
times, Go UP 1. turn Right 3
times, Go UP 1, turn left 5
 Go left 1.

Annotations

Accurately records the location of objects on map using grid references.

Uses position language to describe direction.

Acknowledgment

ACARA acknowledges the contribution of the NSW Department of Education and Communities for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 3: Chance – Removing counters

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

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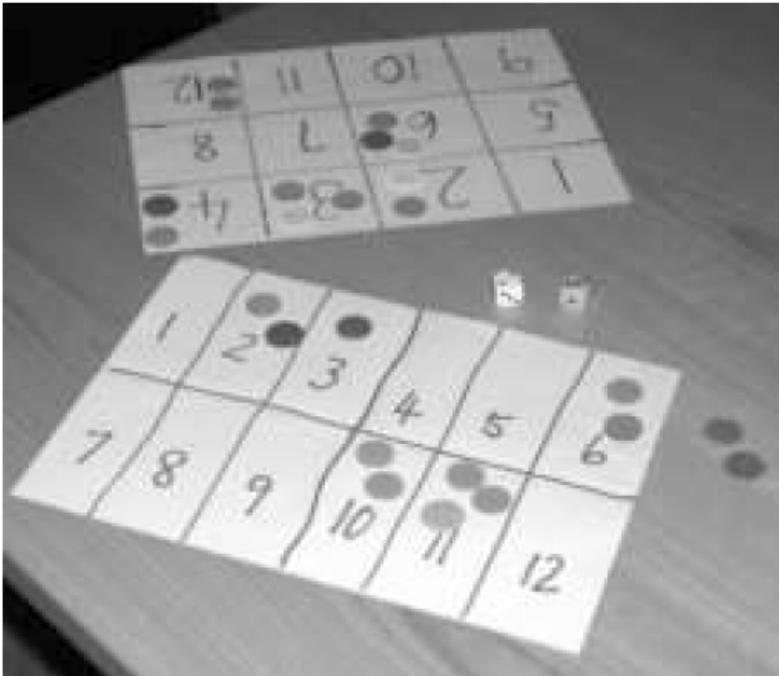
Summary of task

Students made a game board containing the numbers 1 to 12. In pairs, each student was given 12 counters to place on any of the numbers on their game board. Students could choose to place more than one counter on particular numbers and no counters on others.

Students took turns to roll and add two dice. If they have placed counters on the total obtained, they remove them. The first player to remove all their counters from their game board wins. Students predicted the likelihood of the most frequent combination of numbers being rolled.

Mathematics

Work sample 3: Chance – Removing counters



I predict that six will be the most likely total rolled. Six can be made up of $1+5$, $3+3$, $4+2$
My prediction was right in one game and close in the other

Annotations

Applies an understanding of equally likely outcomes in situations involving a dice.

Explains the difference between expected results and actual results.

Acknowledgment

ACARA acknowledges the contribution of the NSW Department of Education and Communities for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 4: Location – Home to the park

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

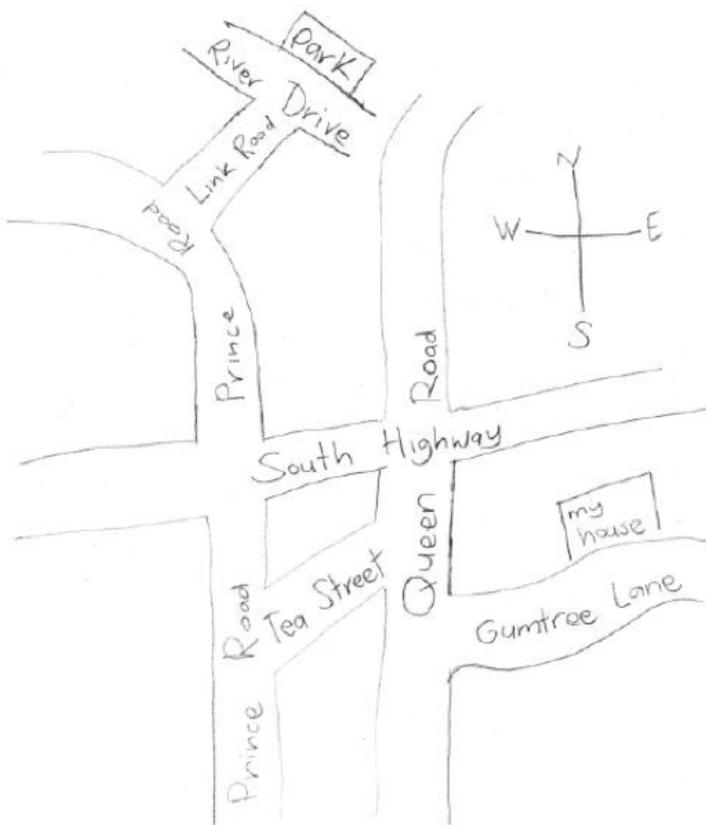
Students have had experience with using a compass and creating simple maps of familiar locations.

Students were asked to draw a map showing their route from home to their local park in response to the task of describing to a friend how they travel to the park. They provided instructions on the route they travelled from home to the park.

Mathematics

Work sample 4: Location – Home to the park

- Drive west along Gumtree Lane
- Go north along Queen Road
- West along South Highway
- North along Prince Road
- North along Link Road
- East along River Drive.



Annotations

Compass points are referred to correctly in written descriptions.

Draws and labels their home, the park and surrounding roads using a 'birds eye' view.

Acknowledgment

ACARA acknowledges the contribution of the VELS (Victoria Essential Learning Standards) in providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 5: Fractions – Representing fractions

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

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Summary of task

Students have been working on fractions of collections as well as fractions of a whole, possibly completed at the end of a unit on fractions.

Students were provided with cardboard and blocks and were asked to compare the size of unit fractions.

Mathematics

Work sample 5: Fractions – Representing fractions

The central graphic features the word "Fractions" in a large, bold, black font inside a white circle. This circle is positioned at the center of a larger white square divided into four quadrants by a horizontal and a vertical line. Each quadrant contains a photograph of a student's work and a corresponding task description written vertically.

- Top-Left Quadrant:** Shows two vertical bars. The left bar is divided into two equal parts, with the top part colored green and the bottom part colored purple. The right bar is divided into three equal parts, with the top two parts colored green and the bottom part colored purple. The task description is: "Show which is bigger – $\frac{1}{2}$ or $\frac{1}{3}$?"
- Top-Right Quadrant:** Shows a square divided into eight equal rectangular sections. The top-left section is green, the top-right is blue, the bottom-left is green, and the bottom-right is blue. Each section contains a small object (a star or a diamond). The task description is: "Show three-eighths of one-whole."
- Bottom-Left Quadrant:** Shows a collection of eight small, rectangular objects arranged in a line. From left to right, they are yellow, blue, blue, blue, blue, red, red, and red. The task description is: "Create a collection of 8 that is $\frac{1}{4}$ red, $\frac{1}{4}$ yellow and $\frac{1}{2}$ blue."
- Bottom-Right Quadrant:** Shows a collection of six small, rectangular objects. Two are blue, two are green, and two are red. Each object is divided into five equal horizontal sections. The task description is: "Divide a collection into fifths."

Annotations

Models and describes one fifth and three eighths.

Describes equal parts of a whole object or collection of objects.

Acknowledgment

ACARA acknowledges the contribution of trial school teachers and students for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 6: Money and financial transactions – Shopping purchases

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

Students were required to cut out six pictures of products with prices from a catalogue and glue one in each box. They were asked to write an addition or subtraction problem that could be solved using each pair of products. Students were then asked to write and solve the algorithm.

Mathematics

Work sample 6: Money and financial transactions – Shopping purchases

12

SHOPPING PROBLEMS

Task: Cut out six pictures of products with prices from a catalogue and glue one in each box. Write an addition or subtraction problem that can be solved using each pair of products. Write and solve the algorithm.






Addition problem How much for the cheese and the yoghurt?

Algorithm $58.97 + 33.95 = 92.92$

Subtraction problem How much more is the cheese than the yoghurt?

Algorithm $58.97 - 33.95 = 25.02$

2. Pictures




Addition problem How much for the chicken and fruit?

Algorithm $\$3.29 + 3.00 = \6.29

Subtraction problem How much more is the fruit than the chicken?

Algorithm $\$3.29 - 3.00 = 29c$

3.




Addition problem How much for the noodles and asparagus?

Algorithm $\$5.99 + \$2.95 = \$8.94$

Subtraction problem How much more is the noodles than the asparagus?

Algorithm $\$5.99 - 2.95 = \3.04

Annotations

Poses purchasing questions that can be solved using addition and subtraction strategies.

Shows calculation to demonstrate how an answer was obtained.

Acknowledgment

ACARA acknowledges the contribution of trial school teachers and students for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 7: Data representations – Interpreting and comparing data displays

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10,000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

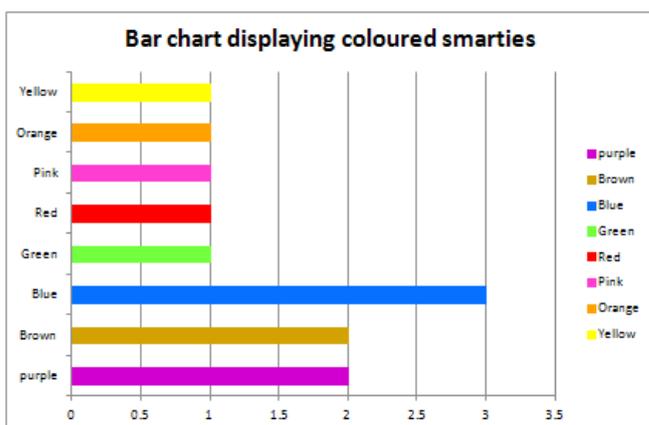
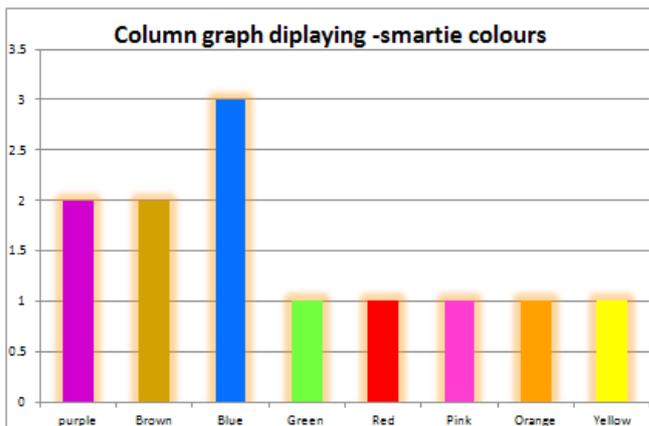
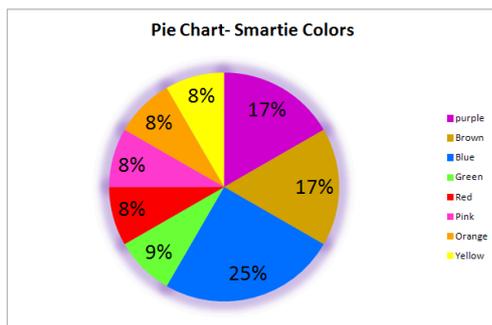
This investigation enabled students to interpret and compare data displays using a computer.

Students were given a medium box of smarties each and were asked to count the number of each coloured smartie to determine the most popular colour. They presented their results. Students discussed in class which chart best represented results using three different data displays - pie, column and bar chart and recorded their answers.

Mathematics

Work sample 7: Data representations – Interpreting and comparing data displays

Color	Number
purple	2
Brown	2
Blue	3
Green	1
Red	1
Pink	1
Orange	1
Yellow	1
Total	12



The column chart and bar chart are best for comparing data. I can easily see that the blue was the most popular colour.

Annotations

Displays data in a table.

Creates a pie chart based on data collected using ICT.

Creates a column graph that displays data accurately using ICT.

Creates a bar chart that displays data accurately using ICT.

Acknowledgment

ACARA acknowledges the contribution of trial school teachers and students for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 8: Clock face

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

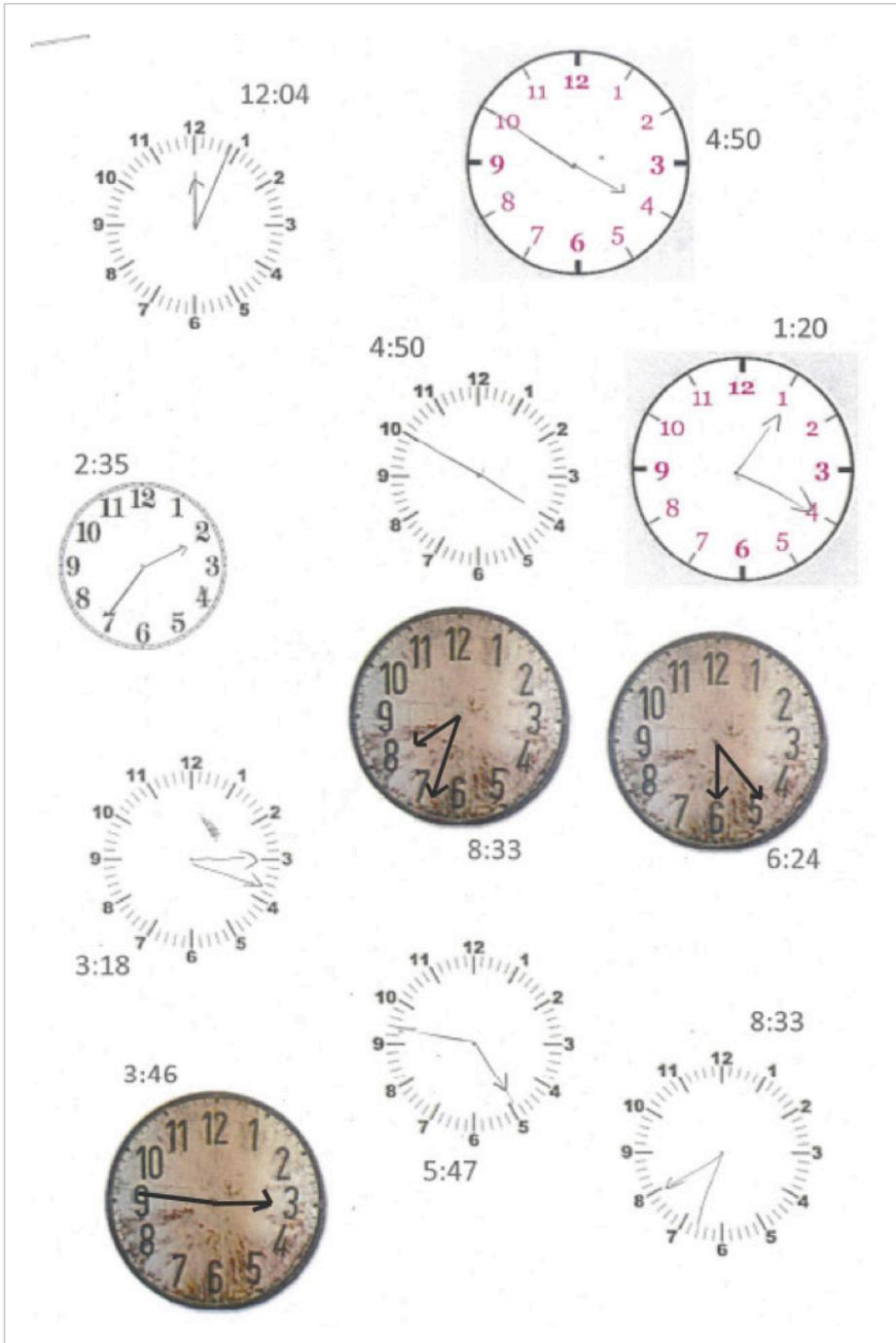
Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

Students were presented with a series of clock faces and times. Students drew the correct time to the nearest minute on each clock face.

Mathematics

Work sample 8: Clock face



Annotations

Draws and correctly identifies time to the nearest minute.

Acknowledgment

ACARA acknowledges the contribution of trial school teachers and students for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.

Mathematics

Work sample 9: Finding the odd number

Relevant parts of the achievement standard

By the end of Year 3, students recognise the connection between addition and subtraction and solve problems using efficient strategies for multiplication. They model and represent unit fractions. They represent money values in various ways. Students identify symmetry in the environment. They match positions on maps with given information. Students recognise angles in real situations. They interpret and compare data displays.

Students count to and from 10 000. They classify numbers as either odd or even. They recall addition and multiplication facts for single digit numbers. Students correctly count out change from financial transactions. They continue number patterns involving addition and subtraction. Students use metric units for length, mass and capacity. They tell time to the nearest minute. Students make models of three-dimensional objects. Students conduct chance experiments and list possible outcomes. They carry out simple data investigations for categorical variables.

Summary of task

Students were presented with the number 18. Students had to write calculations using the four operations resulting in the answer 18. They were asked to circle the odd numbers on their sheet of paper.

Mathematics

Work sample 9: Finding the odd number

Circle the odd number on your page.

20 - 2 = 18

$9 \times 2 = 18$ $\frac{54}{3} = 18$

$8 + 10 = 18$

$3 \times 4 + 6 = 18$ $11 + 7 = 18$

$2 \times 3 \times 3 = 18$ $3 \times 6 = 18$

$36 / 2 = 18$ $14 + 4 = 18$ $6 \times 2 + 6 = 18$

Annotations

Constructs a variety of mathematical problems using different operations

Demonstrates number relationships using the four operations and whole numbers.

Recognises the difference between odd and even numbers.

Acknowledgment

ACARA acknowledges the contribution of trial school teachers and students for providing the tasks and work samples. The annotations are referenced to the Australian Curriculum achievement standards.