Dr Paul Swan & Narelle Rice

Year 4
Quick Curriculum Guide

A reference and guide to the Australian Curriculum Version 9

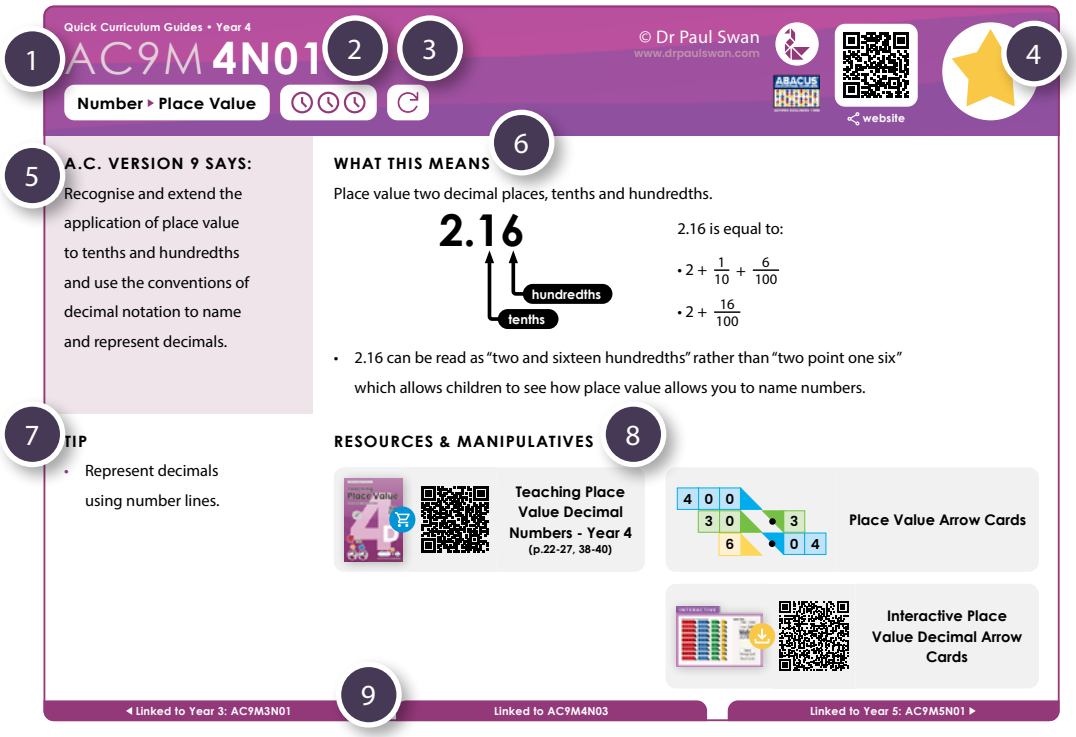
These Quick Curriculum Guides have been designed to take a look at the new Australian Mathematics Curriculum (AC9), explain terminology and provide interpretations. Narelle and I have used our professional judgement to put forward what is appropriate for students at this year level.

Using the Guide Cards

1. The Curriculum 9 code, strand, and our categorisation of content.

2. Our estimate of teaching time required.
   - = a short time (1 or a few lessons)
   - = more time (a few weeks)
   - = lots of time (3 weeks+)

3. This icon means we think this content is best approached with multiple exposures (interleaving).



4. The filled in star means, in our opinion, this is one of the most vital topics for the year level. Often these are pre-requisites for later learning.

5. Text from the curriculum. Terms we define are highlighted.

6. Our explanations, inferences, clarifications and suggestions.

7. Practical tips and sometimes activity ideas.

8. Resources and materials recommendations.

9. Links to other descriptors.
   Bottom left: previous year
   Middle: within this year
   Bottom right: next year

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Acknowledgements

Authors: Dr Paul Swan & Narelle Rice

We would like to also thank Linda Marshall, David Dunstan and Lyndon Rice for comments and assistance.

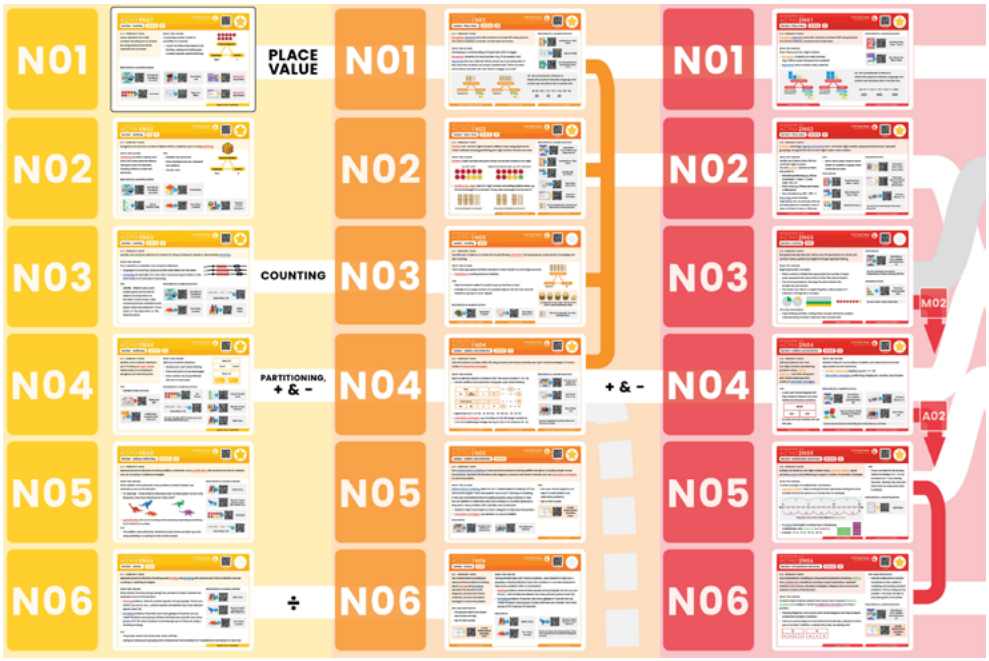
Visual Overview

For a visual overview / planner, see our accompanying overview documents.

We have illustrated the direct connections that exist between and within year levels.

With this information, you can check out the directly related cards in the previous / next year. This is helpful to:

- understand what the students should be bringing in from previous years, and what might need revision,
- the exact difference in understanding from previous years to this year,
- the content that you may be able to bundle together, and,
- what the curriculum describes for next year, so you can avoid accidentally teaching beyond the year level.



These documents serve as general advice only and do not take into account your specific needs and conditions. While best care has been taken in compiling these materials, mistakes may exist.

AC9M 4N01

Number ▸ Place Value

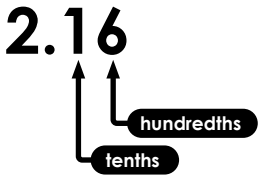
website

A.C. VERSION 9 SAYS:

Recognise and extend the application of place value to tenths and hundredths and use the conventions of decimal notation to name and represent decimals.

WHAT THIS MEANS

Place value two decimal places, tenths and hundredths.



2.16 is equal to:

- $2 + \frac{1}{10} + \frac{6}{100}$
- $2 + \frac{16}{100}$

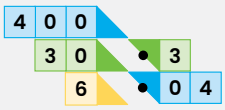
- 2.16 can be read as "two and sixteen hundredths" rather than "two point one six" which allows children to see how place value allows you to name numbers.

TIP

- Represent decimals using number lines.

RESOURCES & MANIPULATIVES

Teaching Place Value Decimal Numbers - Year 4
(p.22-27, 38-40)



Place Value Arrow Cards

***Click the icon or QR to add resources to your cart.*

Interactive Place Value Decimal Arrow Cards

◂ Linked to Year 3: AC9M3N01 | Linked to AC9M4N03 | Linked to Year 5: AC9M5N01 ▸

AC9M 4N02

Number ▸ Properties

website

A.C. VERSION 9 SAYS:

Explain and use the properties of odd and even numbers.

WHAT THIS MEANS

- Even + Even = Even
- Even + Odd = Odd
- Odd + Even = Odd
- Odd + Odd = Even
- This can be linked to divisibility. Even numbers are divisible by two.

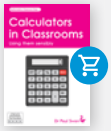
TIP

- Ask the student to determine what happens when you add two even numbers or two odd numbers. They should be the ones to come up with the 'rules' of Even + Even = Even, etc.

RESOURCES & MANIPULATIVES

Problem Solving Number Line Up Puzzles

Calculators



Calculators in Classrooms Book

***Click the icon or QR to add resources to your cart.*

AC9M 4N03

Number ▸ Fractions

website

A.C. VERSION 9 SAYS:

Find equivalent representations of fractions using related denominators and make connections between fractions and decimal notation.

TIP

- Use paper folding to build understanding and record with fraction symbols.

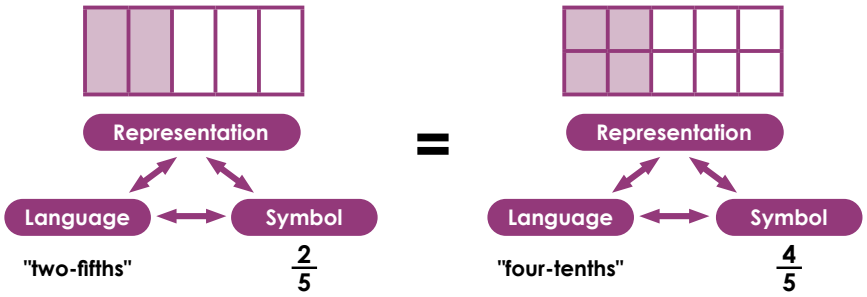
WHAT THIS MEANS

Link fractions with equivalent fractions and decimals.

$\frac{1}{2}$ and $\frac{4}{8}$ represent one-half. $\frac{1}{2}$ and $\frac{5}{10}$ also represent one-half.

$\frac{5}{10}$ may also be written as 0.5 which literally is read as "five-tenths".

- Equivalent representations; decimals are fractions where the denominator is 10, 100, 1000 …
- Related denominators; $\frac{*}{2}, \frac{*}{4}, \frac{*}{8}$
- Make connections; make connections between the fraction words, symbols and physical models.



◂ Linked to Year 3: AC9M3N02 | Linked to AC9M4N01 | Linked to Year 5: AC9M5N03 & AC9M5N04 ▸

AC9M 4N04

Number ▸ Fractions

website

A.C. VERSION 9 SAYS:

Count by fractions including mixed numerals; locate and represent these fractions as numbers on number lines.

RESOURCE

Developing a Conceptual Understanding of Fractions

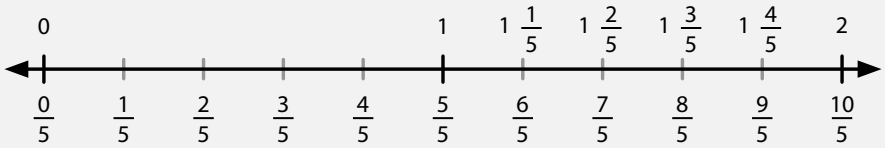
***Click the icon or QR to add resources to your cart.*

WHAT THIS MEANS

Counting in unit fractions (numbers that have a numerator of 1) to one whole and beyond. Showing this on a number line.

- First: 1 one-fifth, 2 one-fifths, 3 one-fifths, 4 one-fifths... 7 one fifths.
- Then: one-fifth, two-fifths, three fifths...
- Mixed numerals; a mixed representation of number using a whole number and proper fraction (less than one whole). Sometimes referred to as "mixed fraction" and "mixed number".

  e.g. $1\frac{1}{4}, 2\frac{1}{2}$.
- Counting $\frac{1}{5}, \frac{2}{5}, \frac{3}{5}, \frac{4}{5}, \frac{5}{5}$ and recognising that five-fifths is another name for 1, then counting on $\frac{6}{5}, \frac{7}{5}, \ldots$
- Represent; $\frac{7}{5}$ (improper fraction) is equivalent to $1\frac{2}{5}$ (mixed numeral).



◂ Linked to Year 3: AC9M3N02 | Linked to Year 5: AC9M5N03 ▸

AC9M 4N05

Number ▸ Place Value

website

A.C. VERSION 9 SAYS:

Solve problems involving multiplying or dividing natural numbers by multiples of powers of 10 without a calculator, using the multiplicative relationship between the place value of digits.

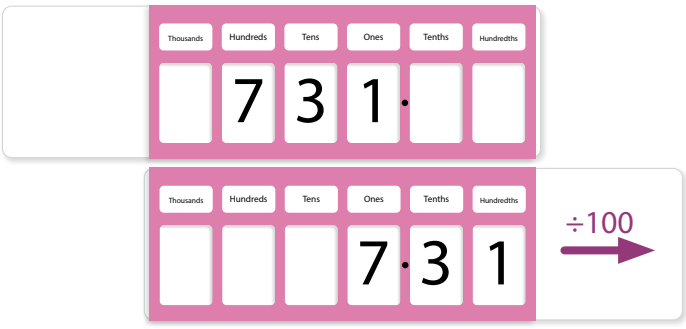
TIPS

- Make the links between units of measure, e.g. when converting from cm to m, divide by 100.
- The curriculum does not require other multiples like 20 or 30.

WHAT THIS MEANS

Multiplying and dividing by 10, 100, 1000 …

- e.g. When dividing by 100 the digits will move two places to the right.
  - A number slide will help to establish these relationships.



- Do NOT suggest that when you multiply by ten "you simply add a zero". This is incorrect and will cause many problems later on, e.g. when multiplying decimals; 0.5 x 10 is not 0.50.
- Year 4; use whole numbers that become decimals. It is only later, in Year 6, that students will start with a decimal number.

Linked to Year 6: AC9M6N06 ▸

AC9M 4N06

Number ▸ Operations +-×÷

website

A.C. VERSION 9 SAYS:

Develop efficient strategies and use appropriate digital tools for solving problems involving addition and subtraction, and multiplication and division where there is no remainder.

TIPS

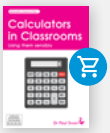
- All the examples given in the elaborations use single and two-digit numbers.
- Be careful linking key words to a single operation.

WHAT THIS MEANS

Calculating with all four operations (+ -, ×, ÷). Note: no remainders.

- Students will need to link their place value understanding with basic fact knowledge to perform calculations.
- Efficient strategies; strategies that don't tax working memory.
- Diagrams (such as the bar model) and materials can help students formulate number sentences which they solve.
- Year 4 is the final year that focuses purely on addition and subtraction of whole numbers. In Year 5 addition and subtraction are applied to solving word problems. In Year 6 students add and subtract decimals. Whole number addition and subtraction will need to be consolidated in this year.

RESOURCES & MANIPULATIVES



Calculators in Classrooms Book

Calculators

***Click the icon or QR to add resources to your cart.*

◂ Linked to Year 3: AC9M3N03 & AC9M3N04

Linked to Year 5: AC9M5N06 & AC9M5N07 ▸

AC9M 4N07

Number ▸ Estimation

website

A.C. VERSION 9 SAYS:

Choose and use estimation and rounding to check and explain the reasonableness of calculations including the results of financial transactions.

WHAT THIS MEANS

Estimation with numbers.

- Estimation and rounding to check; students will likely use basic fact knowledge and place value to work out whether the answer to a calculation is "about right". For example, are they expecting the answer to be in the hundreds or the thousands.
- Explain the reasonableness; reasonableness is often linked to context. In a financial context it does not make sense that a stapler would cost $54 but rather $5.40, for example.

TIP

- Rather than become enslaved to rounding rules consider the context. Often, we need to overestimate.

◂ Linked to Year 3: AC9M3N05

Linked to Year 5: AC9M5N08 ▸

AC9M 4N08

Number ▸ Problem Solving

website

A.C. VERSION 9 SAYS:

Use mathematical modelling to solve practical problems involving additive and multiplicative situations including financial contexts; formulate the problems using number sentences and choose efficient calculation strategies, using digital tools where appropriate; interpret and communicate solutions in terms of the situation.

WHAT THIS MEANS

Solve addition and subtraction multiplication and division problems.

The focus is on working out what type of problem needs to be solved.

- Mathematical modelling; see ACARA's poster.

TIP

- Note the numbers used in the elaborations did not exceed three-digits and mostly involved two-digit numbers.

RESOURCES & MANIPULATIVES

ACARA's Mathematical Modelling Process Poster

Problem Solving Money Puzzles For Years 4-6

Calculators

***Click the icon or QR to add resources to your cart.**

◂ Linked to Year 3: AC9M3N06

Linked to Year 5: AC9M5N09 ▸

AC9M 4N09

website

Number ▸ Patterns

A.C. VERSION 9 SAYS:

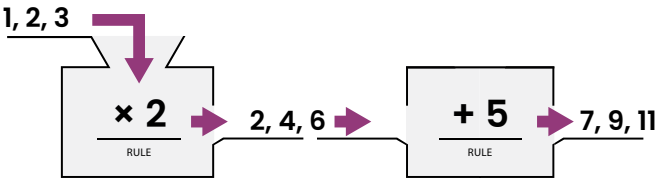
Follow and create algorithms involving a sequence of steps and decisions that use addition or multiplication to generate sets of numbers; identify and describe any emerging patterns.

TIPS

- Draw up a flow chart to show a series of steps to produce a sequence.
- Try using simple formulas in spreadsheets.

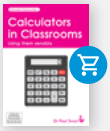
WHAT THIS MEANS

Follow a set of steps and note what pattern is formed. Then write a set of steps that form a pattern.



- Algorithms; Creating a series of steps to produce a sequence.
  This is NOT talking about standard written algorithms used in calculating.

RESOURCES & MANIPULATIVES



Calculators in Classrooms Book

Calculators

***Click the icon or QR to add resources to your cart.**

◂ Linked to Year 3: AC9M3N07

Linked to Year 5: AC9M5N10 ▸

AC9M 4A01

website

Algebra ▸ Addition and Subtraction

A.C. VERSION 9 SAYS:

Find unknown values in numerical equations involving addition and subtraction, using the properties of numbers and operations.

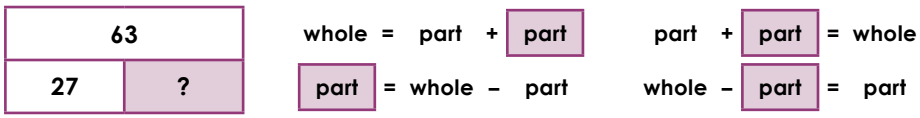
TIP

- Year 4 involves addition and subtraction. Year 5 involves multiplication and division.

WHAT THIS MEANS

Working out unknown values in calculations like 27 + ? = 63 or ? = 63 - 27

- To help work out the unknown value students can use diagrams such as part-part whole or bar diagrams. This will assist in understanding the commutative property of addition (rearranging parts) and inverse operation – linking addition and subtraction.
- Students may draw on properties of number such as the commutative property of addition (7 + 2 = 2 + 7), that is, rearrange the parts (see part-part whole diagram).



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◂ Linked to Year 3: AC9M3A01

AC9M 4A02

website

Algebra ▸ Basic Multiplication Facts

A.C. VERSION 9 SAYS:

Recall and demonstrate proficiency with multiplication facts up to 10 × 10 and related division facts; extend and apply facts to develop efficient mental strategies for computation with larger numbers without a calculator.

WHAT THIS MEANS

Learn your tables with understanding.

- Proficiency with multiplication facts; once a bank of multiplication facts has been developed start to relate these to division facts.
- Mental strategies; will help students learn their multiplication and division facts but remember the aim is recall or remembering facts.

TIP

- Skip counting is not an efficient mental strategy.

RESOURCES & MANIPULATIVES

Tackling Tables	Multispin Games	Spindiv Games
Dice Games for Tables	COMBO Card Game	Dice (e.g. six and ten sided dice)

***Click the icon or QR to add resources to your cart.**

◂ Linked to Year 3: AC9M3A03

Linked to Year 5: AC9M5A01 ▸

AC9M 4M01

website

Measurement ▸ Units

A.C. VERSION 9 SAYS:

Interpret unmarked and partial units when measuring and comparing attributes of length, mass, capacity, duration and temperature, using scaled and digital instruments and appropriate units.

TIP

- A variety of scales and scaled instruments should be used.

WHAT THIS MEANS

Measure things in metric units with both scaled (analog) and digital instruments. Students need to actively use instruments to measure things.

- Analog scales are basically number lines. Students will need to be taught how to read between the intervals on the scale. Reading to the nearest or judging that it is halfway between.
- The elaborations refer to reading times on analog clocks without minute markings.

MANIPULATIVES

Trundle Wheel	Student Electronic Timers/Digital Timers

***Click the icon or QR to add resources to your cart.**

◂ Linked to Year 3: AC9M3M01

Linked to AC9M4M03

Linked to Year 5: AC9M5M01 ▸

AC9M 4M02

website

Measurement ▸ Perimeter and Area

A.C. VERSION 9 SAYS:

Recognise ways of measuring and approximating the perimeter and area of shapes and enclosed spaces, using appropriate formal and informal units.

WHAT THIS MEANS

Students add lengths to determine the perimeter of simple shapes or count squares to work out the area of a shape.

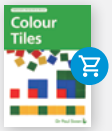
This is the first mention of perimeter and area.

- Students use string to determine the perimeter of curved shapes.
- Students need to consider part squares.
- No mention is made of formulas.

TIP

- Square tiles or grid paper can be used to determine the area of shapes.

RESOURCES & MANIPULATIVES



Colour Tiles Book

Colour Tiles

Grid Page Download

***Click the icon or QR to add resources to your cart.*

Linked to Year 5: AC9M5A02 ▸

AC9M 4M03

website

Measurement ▸ Time Duration

A.C. VERSION 9 SAYS:

Solve problems involving the duration of time including situations involving "am" and "pm" and conversions between units of time.

WHAT THIS MEANS

Calculating the elapsed time between two events. Converting between times.

- Students need to consider am and pm times when the event goes past noon or midnight.
- Students use the relationships between times e.g. 60 seconds = 1 minute, 60 minutes = 1 hour and so on to convert between time units.

TIPS

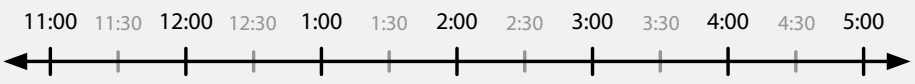
- Often elapsed time questions will show a start time in analog form and a finish time in digital form (or vice versa). am and pm notation is very important.
- Number lines are a great way of calculating elapsed time.

Jan looked at the clock as she got on the train in the morning, and at the digital clock at the final destination.

How long was her train trip?

Departure Clock

Arrival Clock



◂ Linked to Year 3: AC9M3M03 and AC9M3M04
Linked to AC9M4M01
Linked to Year 5: AC9M5M03 ▸

AC9M 4M04

Measurement ▸ Angle

website

A.C. VERSION 9 SAYS:

Estimate and compare angles using angle names including acute, obtuse, straight angle, reflex and revolution, and recognise their relationship to a right angle.

TIPS

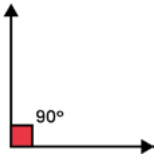
- This does not mean using a protractor to measure angles. The focus is on estimating angle sizes using a right angle as a benchmark.
- Look at a pair of scissors. Consider the angles made.

WHAT THIS MEANS

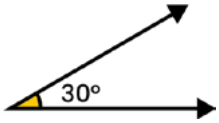
Students will need to be familiar with some benchmark angles e.g. right angles (a corner) to help classify other angle types.

- A right angle measures 90°. e.g. where a wall meets the floor is a right angle.
- Classifications: right angle (90°), acute angle (less than 90°), obtuse angle (greater than 90° but less than 180°), straight angle (180°), reflex angle (greater than 180° and less than 360°).
- Links to the real world can be made by using spirit levels and set squares.

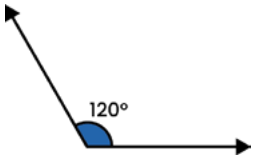
Right angle: (90°)



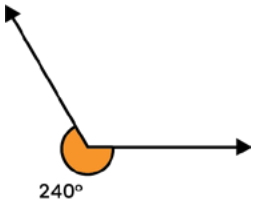
Acute angle: (under 90°)



Obtuse angle: (>90° and <180°)



Reflex angle: (>180° and <360°)



◂ Linked to Year 3: AC9M3M05

Linked to Year 5: AC9M5M04 ▸

AC9M 4SP01

Space ▸ 2D Shapes and 3D Objects

website

A.C. VERSION 9 SAYS:

Represent and approximate composite shapes and objects in the environment, using combinations of familiar shapes and objects.

WHAT THIS MEANS

Combining shapes (2D) to form other shapes.
Combine objects (3D) to make other objects.

- Cubes may be joined to make models.
- There are opportunities to use software to draw in 2D and 3D.

TIP

- Students can use shapes to design logos.

RESOURCES & MANIPULATIVES

Tangram Puzzles Booklet

Tangrams

Maths Cubes

Cubes in the Classroom

Toying with Tangrams Book

Geometry Cut-Out Puzzles

***Click the icon or QR to add resources to your cart.*

◂ Linked to Year 3: AC9M3SP01

Linked to Year 5: AC9M5SP01 ▸

AC9M 4SP02

Space ▸ Maps

website

A.C. VERSION 9 SAYS:

Create and interpret grid reference systems using grid references and directions to locate and describe positions and pathways.

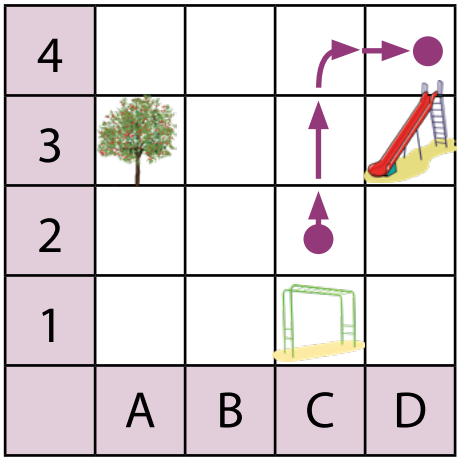
WHAT THIS MEANS

This is the first mention of grid references. Students can read grid references and use grid references to make a map.

- Keys / legends and scales are not mentioned.

TIPS

- Note grid references are different to co-ordinates. Co-ordinates are first mentioned in Year 5.
- Students should refer to the horizontal part and then the vertical part.
- The elaborations mention using grids to enlarge images.



"The trail starts at C2 and ends at D4"

◂ Linked to Year 3: AC9M3SP02

Linked to Year 5: AC9M5SP02 ▸

AC9M 4SP03

Space ▸ Symmetry

website

A.C. VERSION 9 SAYS:

Recognise line and rotational symmetry of shapes and create symmetrical patterns and pictures, using dynamic geometric software where appropriate.

TIPS

- Try a Google image search on the term 'Symmetry'.
- Many drawing apps include a 'symmetry' mode.
- Tessellation can be related to area.

WHAT THIS MEANS

Students understand the two types of symmetry: line symmetry and rotational symmetry. Students use this knowledge to draw pictures.

- This is the first mention of symmetry.
- The elaborations mention tessellations. Tessellations refer to tiling patterns.

Rotational Symmetry

Tessellation

RESOURCES & MANIPULATIVES

Pattern Blocks

Pattern Blocks Book

***Click the icon or QR to add resources to your cart.*

Linked to AC9M4M02

Linked to Year 5: AC9M5SP03 ▸

AC9M 4ST01

website

Statistics ▸ (1) Gather, (2) Display, (3) Communicate

A.C. VERSION 9 SAYS:

Acquire data for categorical and discrete numerical variables to address a question of interest or purpose using digital tools; represent data using many-to-one pictographs, column graphs and other displays or visualisations; interpret and discuss the information that has been created.

WHAT THIS MEANS

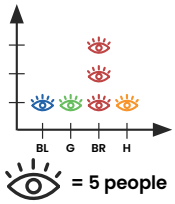
Collect categorical data (types or categories). Collect numerical data that can be counted (discrete). Display the data. Think and talk about the data.

TIPS

- At Year 4 students require explicit instruction about which type of graph is appropriate.
- The graphs need to show many-to-one data such as a pictograph that shows one image to depict 5 people.

Qualitative Data
Categorical

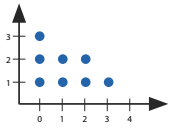
- ✓ Nominal: descriptive categories. e.g. eye colour, ***types*** of pets



- ✓ Ordinal: ordered descriptive categories. e.g. product star ratings

Quantitative Data
Numerical

- ✓ Discrete: countable. e.g. ***number*** of pets in the family ("how many families have one/two/three... pets")



- NOT YET Continuous: measured. e.g. height, rainfall

◂ Linked to Year 3: AC9M3ST01 & AC9M3ST02 | Linked to AC9M4ST02 & AC9M4ST03 | Linked to Year 5: AC9M5ST01 ▸

AC9M 4ST02

website

Statistics ▸ (2) Display

A.C. VERSION 9 SAYS:

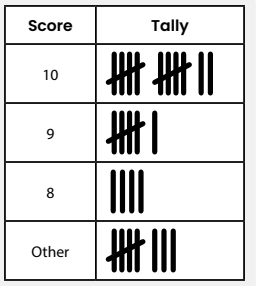
Analyse the effectiveness of different displays or visualisations in illustrating and comparing data distributions, then discuss the shape of distributions and the variation in the data.

WHAT THIS MEANS

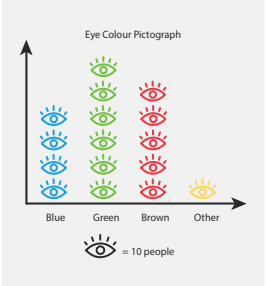
- Reading and interpreting graphs and tables to answer questions.
- Identifying which table / graph is best for a given context.
- Make comments about how spread out the data is (the shape of it).

TIP

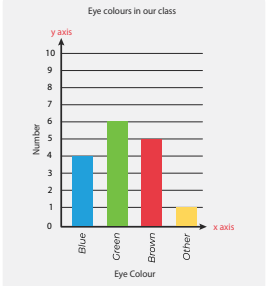
- It would make sense to combine 4ST01, 4ST02 and 4ST03.



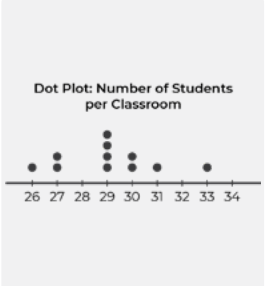
Tally



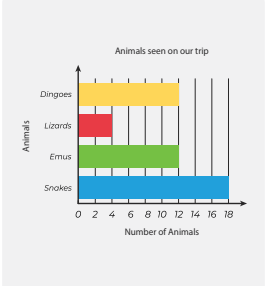
Pictograph



Column Graph



Dot Plot



Horizontal Bar Graph

◂ Linked to Year 3: AC9M3ST02 | Linked to AC9M4ST01 & AC9M4ST03 | Linked to Year 5: AC9M5ST02 ▸

AC9M 4ST03

website

Statistics ▸ (1) Gather, (2) Display, (3) Communicate

A.C. VERSION 9 SAYS:

Conduct statistical investigations, collecting data through survey responses and other methods; record and display data using digital tools; interpret the data and communicate the results.

TIP & RESOURCE

- See ACARA's Statistical Investigation Process poster.

ACARA's Statistical Investigation Process Poster

WHAT THIS MEANS

(1) Gather the data, (2) display the data using tables and graphs and (3) interpret and communicate the data.

- Students design and conduct surveys and create displays (graphs and tables) to answer questions.
- Students can collect data from reliable online sources.

LINKING ST01, ST02 AND ST03

Elements of statistics this year:

(1) GATHER Ask a question → **(2) DISPLAY** Table, Graph → **(3) INTERPRET & COMMUNICATE**

◂ Linked to Year 3: AC9M3ST03 | Linked to AC9M4ST01 & AC9M4ST02 | Linked to Year 5: AC9M5ST03 ▸

AC9M 4P01

website

Probability ▸ Language

A.C. VERSION 9 SAYS:

Describe possible everyday events and the possible outcomes of chance experiments and order outcomes or events based on their likelihood of occurring; identify independent or dependent events.

WHAT THIS MEANS

Predict the outcome of chance events. Conduct chance experiments and discuss the results.

- Students need to distinguish between events where the outcome is not affected by a previous event (independent) and outcomes that are affected by previous events.
- The outcome of flipping a coin is not affected by the outcome on the previous flip. It is an independent event.
- Drawing coloured cubes from a bag and not replacing them will affect the chance of drawing a coloured cube out of the bag. It depends on the colour that was drawn out in the previous event.

TIP

- We suggest first ordering independent events. Then move to dependent events.

RESOURCES & MANIPULATIVES

Tackling Tables

Probability Chance Experiments - Middle Primary

Classroom Dice Pack

Two Colour Counters

Also try: Spinners (round spinners, suction spinners), Drawstring bags

***Click the icon or QR to add resources to your cart.*

◂ Linked to Year 3: AC9M3P01 | Linked to AC9M4P02 | Linked to Year 5: AC9M5P01 ▸

AC9M 4P02

Probability ▸ Experiments

website

A.C. VERSION 9 SAYS:

Conduct repeated chance experiments to observe relationships between outcomes; identify and describe the variation in results.

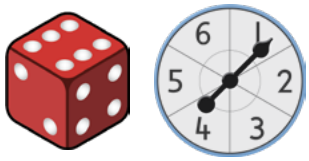
WHAT THIS MEANS

Try chance experiments. Record the data over a number of trials and discuss.

- The elaborations mention virtual random generators e.g. programs that simulate flipping coins. These are ideal when collecting long run data e.g. thousands of flips.

TIP

- The same experiment may be carried out with different materials e.g. rolling a 1-6 dice and flicking a spinner on a 1-6 template.



RESOURCES & MANIPULATIVES

Probability Chance Experiments - Middle Primary	Interactive Probability Chance Experiments
Two Colour Counters	Interactive Dice Simulator
Classroom Dice Pack	Interactive Long Run Probability Simulator

***Click the icon or QR to add resources to your cart.*

◂ Linked to Year 3: AC9M3P02 | Linked to AC9M4P01 | Linked to Year 5: AC9M5P02 ▸