Dr Paul Swan & Narelle Rice

Year 3 Quick Curriculum Guide

erence and guide to the Australian Curriculum

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



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



() () () = lots of time (3 weeks+)

This icon \mathbb{C} means we think this content is best approached with multiple exposures (interleaving).



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.

Text from the curriculum. Terms we define are highlighted.

6

clarifications and suggestions. Practical tips and sometimes activity ideas.

8

Resources and materials recommendations.



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



Dr Paul Swan www.abacused.c

Dr Paul Swan & Narelle Rice

Year 3 Quick Curriculum Guide

A reference and guide to the Australian Curriculum Version 9

Acknowledgements

Authors: Dr Paul Swan & Narelle Rice

We would like to also thank Linda Marshall and David Dunstan 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.

Australian Curriculum version 9 materials used under Creative Commons licence from ACARA. Readers should always refer back to the curriculum itself and the state-based curriculum that is relevant for you.

This document is copyright of A-Z Type (Dr Paul Swan). A copy of this document may be downloaded from www.drpaulswan.com.au.

Quick Curriculum Guides • Year 3 9M 3N01 Number ► Place Value ()()()()

© Dr Paul Swan



A.C. VERSION 9 SAYS:

Recognise, represent and order natural numbers using naming and writing conventions for numerals beyond 10000.

WHAT THIS MEANS

Students use whole numbers at least into the millions in a HTO HTO pattern in numerals and words.

- Recognise; students can read numbers (e.g. 72 000 as seventy-two thousand).
- Represent; show numbers using number lines. Using physical materials beyond 4-digit numbers becomes difficult.
- Natural numbers; 1, 2, 3, (note: the ACARA glossary includes 0).
- This is the last reference to whole number place value. Year 4 moves on to decimal place value.

TIP

To fully understand the HTO HTO pattern, students need to see three repetititions. This means reading and writing numbers into the hundreds of millions.



Linked to Year 2: AC9M2N01

RESOURCES & MANIPULATIVES



Teaching Place Value - Year 3



Interactive Place Value Arrow Cards

> **Hundreds Tens** Ones (HTO)

> > Spinner

**Click the icon or QR to add

resources to your cart.



See also: Dice Games for Place Value

Linked to AC9M3N03 and AC9M3A01

© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.3

Quick Curriculum Guides • Year 3 C9M 3N02

Fractions > Adding Fractions

A.C. VERSION 9 SAYS:

Recognise and represent unit fractions including $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$ and their multiples in different ways; combine fractions with the same denominator to complete the whole.

WHAT THIS MEANS

Students can add fractions with the same denominator (up to a whole).

- Unit fractions have a numerator of 1.
- Multiples; e.g. $\frac{2}{10}$ is a multiple of $\frac{1}{10}$.
- Represent fractions using materials such as rods (length) and Pattern Blocks (area), collections of materials such as counters, diagrams (rectangles then circles), or fraction notation such as $\frac{1}{5}$ spoken as one-fifth.





Linked to Year 4: AC9M4N01 ►

TIPS

Stop at one whole.

Mixed numerals and improper fractions are not mentioned until

Year 4 (AC9M4N04).

RESOURCES & MANIPULATIVES



Coloured Rods

Pattern

Blocks











Reasoning with Rods Book

▲ Linked to Year 2: AC9M2N03

© Dr Paul Swan



9M 3NO3

Number > Addition & Subtraction

A.C. VERSION 9 SAYS:

Add and subtract two- and threedigit numbers using place value to <u>partition</u>, rearrange and <u>regroup</u> numbers to assist in calculations without a calculator.

WHAT THIS MEANS

Adding and subtracting, two numbers up to three digits each.

- Partition (by place value); split numbers according to standard place value (e.g. 435 as 400 + 30 + 5) or non-standard place value (e.g. 420 + 15) to help calculate. (See the card for 2N02 for more information.)
- <u>Regroup</u>; when adding 8 tens and 5 tens the result is 13 tens or regrouped or recorded as 1 hundred and 3 tens.

TIP

 Students need to see various ways of adding and subtracting, including standard written algorithms. They require flexible thinking about place value.

RESOURCES & MANIPULATIVES



© Dr Paul Swan

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

Linked to Year 4: AC9M4N06 ►

Linked to AC9M3N01 © Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.4

C

Quick Curriculum Guides • Year 3

Number > Multiplication & Division

A.C. VERSION 9 SAYS:

Multiply and divide oneand two-digit numbers, representing problems using number sentences, diagrams and arrays, and using a variety of calculation strategies.

TIP & RESOURCE

 Diagrams such as arrays will help to interpret multiplication and division questions. See nrich.



Arrays, Multiplication and Division nrich Maths.

WHAT THIS MEANS

 $\bigcirc \bigcirc \bigcirc \bigcirc$

Multiplying up to two-digit numbers. Dividing by one-digit numbers.

• <u>Calculation strategies</u>; using 16×5 as an example, strategies might include partitioning the 16 into 10 and 6, multiplying both parts by 5 and adding the parts together (50 + 30) to achieve an answer of 80. Another strategy might involve halving 16 (8) and doubling 5 (10) and multiplying 8 by 10. There are many strategies, some more efficient than others.



© Dr Paul Swan



A.C. VERSION 9 SAYS:

Number **>** Estimation

Estimate the quantity of objects in collections and make estimates when solving problems to determine the reasonableness of calculations.

WHAT THIS MEANS

Estimation with numbers.

- Estimate in this context is not referring to measurement but rather numbers. Strategies might include:
 - Benchmark numbers such as using the number of people in a section of a stadium to determine the size of the crowd.

TIPS

- Encourage students to check the calculations they make when doing AC9M3N03 and AC9M3N04.
- There are many ways to estimate. Estimating often relies heavily on the context.
- Stategies include front-end approaches, rounding, clustering and compatible numbers.
- Apply number sense. For example, when multiplying a single-digit number by a two-digit number the answer will be a two- or three-digit number.

Linked to AC9M3N03 and AC9M3N04

Linked to Year 4: AC9M4N07 ►





A.C. VERSION 9 SAYS:

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

WHAT THIS MEANS

Solve addition / subtraction and multiplication / division word problems (that is, problems in a context).

- Mathematical modelling involves working out what is required to solve a word problem.
- <u>Formulate problems</u>; diagrammatic approaches such as the bar model will help students understand the problem and create number sentences (equations).

TIPS

- Additive Situations. These involve contents where you might add or subtract to solve a question.
- Multiplicative Situations are contexts that might require multiplication/division (no remainders) to solve a question.

RESOURCES & MANIPULATIVES



Solving NAPLAN-Style Word Problems



Mathematics and Money Book





© Dr Paul Swan



Linked to Year 4: AC9M4N09 ►

A.C. VERSION 9 SAYS:

Number > Pattern

Follow and create algorithms involving a sequence of steps and decisions to investigate numbers; describe any emerging patterns.

WHAT THIS MEANS

Use rules made by others to generate patterns. Make rules for others to follow.

- <u>Algorithms;</u> an algorithm is a step-by-step procedure. This content descriptor is NOT referring to standard written algorithms.
- Emerging patterns; e.g. constant increase. Entering + 3 = = = on some basic calculators will generate the pattern 3, 6, 9, 12, ...

TIPS

- Flow charts are examples of algorithms.
- Students should be exposed to patterns, and identify and extend these patterns before devising their own algorithms for patterns.
- This leads to the use of spreadsheets in Year 4: AC9M4N09.



RESOURCES & MANIPULATIVES



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

© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.6



A.C. VERSION 9 SAYS:

Recognise and explain the connection between addition and subtraction as <u>inverse operations</u>, apply to <u>partition numbers</u> and find unknown values in number sentences.

WHAT THIS MEANS

Link addition and subtraction

 <u>Inverse operations</u>; refers to the fact that subtraction undoes addition and vice versa.

e.g. 6 + 3 = 9, 9 - 3 = 6 or 9 - 6 = 3

- <u>Partition numbers</u>; split according to place value. eg. 45 = 40 + 5 or 30 + 15
- <u>Unknown values</u>; the unknown value in a number sentence may be found using an inverse operation.
 48 + ? = 195, may be solved by

subtracting 48 from 195.

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

TIP

• Unknown values can be represented using a part-part-whole diagram to help students recognise the connection between addition and subtraction.



RESOURCES & MANIPULATIVES



Bond Blocks Core Addition & Subtraction Kit





Linked to AC9M3N01

© Dr Paul Swan



= 15

= 15

7

8

80 + 70 = 150

70 + 80 = 150

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

Automatic and rapid recall.

required.

knowledge.

 Automatic recall implies the fact is so well known that

little mental processing is

• Rapid recall implies speed.

Researchers use a three second

rule when assessing basic fact

A.C. VERSION 9 SAYS:

Extend and apply knowledge of addition and subtraction facts to 20 to develop efficient mental strategies for computation with larger numbers without a calculator.

WHAT THIS MEANS

Students use basic addition and subtraction facts.

9M **3A02**

Algebra > Addition and Subtraction

- Extend; e.g., 7 + 7 extends to 17 + 7 and then 70 + 70, etc.
- <u>Knowledge;</u> use a bank of known addition facts to generate the related subtraction facts. Part-part whole thinking (diagrams) will help.
- Efficient mental strategies; the strategy used does not tax short-term working memory. Counting in ones more than three is inefficient.

RESOURCES & MANIPULATIVES



Bond Blocks Core Addition & Subtraction Kit



 $\bigcirc \bigcirc \bigcirc \bigcirc$

COMBO - Basic Facts Game for Years 3 - 7

15

extend to

150

8

80

7

70

© Dr Paul Swan



TIPS

Games to play using COMBO Cards

Linked to Year 4: AC9M4A01 ▶

= 7

8

15 - 7 = 8

150 - 80 = 70

150 - 70 = 80

15 -

▲ Linked to Year 2: AC9M2A02

© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.7

AC9M**3A03**

Algebra > Multiplication Basic Facts

A.C. VERSION 9 SAYS:

Recall and demonstrate proficiency with multiplication facts for 3, 4, 5 and 10; extend and apply facts to develop the related division facts.

WHAT THIS MEANS

Students learn their 3, 4, 5 & 10 tables and related division facts.

- <u>Recall</u>; students can bring back to mind something they have learned.
 Using a mental strategy to reconstruct a fact would not constitute recall, but it is important that a student can reconstruct a forgotten fact.
- <u>Related;</u> relating division facts means that students are taught with understanding, so they link multiplication and division.

RESOURCES & MANIPULATIVES





Multispin & Spindiv

Cards (e.g. School Friendly Cards and COMBO)

сомво)





Dice

Dice (e.g. six / ten sided dice, pocket dice)

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

7

Quick Curriculum Guides • Year 3 AC9M 3M0 Measurement > Units

© Dr Paul Swan



A.C. VERSION 9 SAYS:

Identify which metric units are used to measure everyday items; use measurements of familiar items and known units to make estimates.

WHAT THIS MEANS

Knowing units such as millimetres (mm), centimetres (cm), metres (m), kilometres (km), millilitres (mL), litres (L), grams (g), kilograms (kg).

• Identify; Year 3 is the first mention of metric units. This descriptor only mentions identifying where metric units are used and using this to make estimates. e.g. A student might identify length or height is measured in centimetres.

TIPS

- Becoming familiar with a few benchmark measurements will help when estimating.
 For example, knowing your own height helps to estimate height. Knowing that cooldrink comes in a 2 L container can help estimate capacity. Likewise lifting items such as a kilogram of sugar will give students a 'feeling' for mass.
- Note: mass cannot be estimated by looking; students need to handle the object(s). Hefting (holding two different objects, one in each hand, and comparing) is good for developing the concept of mass.

inked to AC9M3M02

© Dr Paul Swan

Linked to Year 4: AC9M4M01 ►

© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.8

AC9M 3M02 Measurement > Measuring (S) (C)

A.C. VERSION 9 SAYS:

Quick Curriculum Guides • Year 3

Measure and compare objects using familiar metric units of length, mass and capacity, and instruments with labelled markings.

WHAT THIS MEANS

Students need to measure using instruments such as rulers, tailor/dressmaker tapes, jugs and scales with markings. TIPS

- Students will need to be taught how to read the <u>different markings</u> on the instrument and what happens when the length falls between two markings on a tape, when the arrow falls between two marks on a set of kitchen scales, or when a liquid is between two marks on the scale. This is an application of number lines in real life. Note not all tapes are labelled the same so you will need an assortment of different types.
- Vertical scales can prove more difficult for students to read.

MANIPULATIVES



Measurement > Time Duration

/ **3M03**

 \bigcirc





A.C. VERSION 9 SAYS:

Recognise and use the relationship between formal units of time including days, hours, minutes and seconds to estimate and compare the duration of events.

TIPS

- Do AC9M3M04 before this.
 Students need to be able to read time in order to calculate duration.
- The elaborations focus on events directly related to the students, not abstract calculations of duration.
- Students use a calendar to work out the duration of longer events.

WHAT THIS MEANS

Measuring the duration of time, NOT telling the time.

- Students can use simple timers such as sand timers to measure short time periods and stopwatches (digital) for longer events.
- Experience with timing devices will help students develop benchmarks for estimating the passing of time.

RESOURCES & MANIPULATIVES



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

Linked to AC9M3M04 © Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.9



A.C. VERSION 9 SAYS:

Describe the relationship between the hours and minutes on analog and digital clocks, and read the time to the nearest minute.

WHAT THIS MEANS

Telling the time on analog and digital clocks to the nearest minute.

- This is the first official mention of digital clocks in the curriculum. However in Year 2 (AC9M2M04) we advised some connections be made between analog and digital clocks.
- The difference between reading analog clocks and digital clocks will need to be explicitly taught. Analog clocks are read using different language to digital clocks. For example, "a quarter past 10" would be read as ten fifteen on a digital clock.

TIPS

- Time will require teaching lessons, follow up regular review sessions and regular incidental references throughout the school day.
- "Quarter to" is the only recommended use of 'to.' Times such as 10:40 would not be read as "twenty to eleven."

MANIPULATIVES



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

Linked to Year 4: AC9M4M03 ►

© Dr Paul Swan

TIPS

until Year 5.



Protractors are not mentioned

familiar angle to students and

Right angles are the most

are a great benchmark.

visualise the turns.

• Try using an angle measure to

A.C. VERSION 9 SAYS:

Measurement > Angle

Identify angles as measures of turn and compare angles with right angles in everyday situations.

WHAT THIS MEANS

Students can identify where angles (turns) occur and compare them.

Measures of turn does not mean measuring with a protractor.

• Identify angles; identifying where turning occurs e.g. turning a tap on; one full turn.

9M 3M05

• <u>Compare</u>; comparisons are made in terms of quarter, half and threequarter turns. The term right angle is used and linked to corners.





A.C. VERSION 9 SAYS:

Recognise the relationships between dollars and cents and represent money values in different ways.

WHAT THIS MEANS

Equivalent values of money (and working out change with simple amounts of money).

• Recognise ways to make one dollar.



Students need to recognise there are many ways to make one dollar.

• While not explicitly stated in the content descriptor, the elaborations mention calculating change by applying part-part-whole thinking.

Whole		\$2		Calculating change from \$2 when
Item	Change	\$1.30		buying a single \$1.30 item

RESOURCES & MANIPULATIVES



Mathematics and Money (Equivalence Activities)



Problem Solving Money Puzzles - Years 4 - 6 (Extension)









© Dr Paul Swan



A.C. VERSION 9 SAYS:

Space ► 3D Objects

Make, compare and classify objects, identifying key features and explaining why these features make them suited to their uses.

WHAT THIS MEANS

Making and identifying features of 3D objects.

A 35P01

- Make; refers to students building objects using cubes (e.g. larger cubes, rectangular prisms).
- <u>Classify objects</u>; classifying geometric objects would involve the use of language such as <u>vertices</u>, <u>faces</u> and <u>edges</u>. Begin with prisms and pyramids before moving to spheres, cones and cylinders as they include curved surfaces.

TIP

In the previous year, 2SP01, students focused on 2D shapes whereas 3SP01 deals with 3D objects.

MANIPULATIVES



A.C. VERSION 9 SAYS:

Interpret and create two-dimensional representations of familiar environments, locating key landmarks and objects relative to each other.

WHAT THIS MEANS

Reading and making simple maps (scale and co-ordinates NOT required).

- Interpret; students follow maps.
- Create; students make their own maps showing key landmarks.

TIPS

- The maps should be simple and relate to familiar places like a classroom.
- In Year 2 students are required to locate positions in two-dimensional representations, whereas in year 3 are asked to interpret and create them.



RESOURCE



Teaching Mathematics Through Story Books 2 (Years 2-3)

Statistics ► (1) Gather, (2) Display

∕/ **3STO1**

© Dr Paul Swan



A.C. VERSION 9 SAYS:

Acquire data for categorical and discrete numerical variables to address a question of interest or purpose by

observing, collecting and <u>accessing data</u> sets; record the data using appropriate methods including frequency tables and spreadsheets.

WHAT THIS MEANS

Collect data to answer questions about 'types' or categories and record in a table. The table could be on a spreadsheet.

- <u>Discrete numerical variables</u>; means you can count it (i.e. 'how many?'). This can then be tallied. The tally marks can be counted to work out the frequency.
- Accessing data; use data collected by others. The reliability of the source (who collected the original data) needs to be considered.

TIP

• It would make sense to combine 3ST01, 3ST02 and 3ST03.

How students came to school.				
Transport	Tally	Total (Frequency)		
Walk		12		
Bicycle		4		
Car	₩ III	9		
Bus		3		
Train		4		

▲ Linked to Year 2: AC9M2ST01 Linked to AC9M3ST02 and AC9M3ST03 Linked to Year 4 ➤ AC9M4ST01

 © Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.12



A.C. VERSION 9 SAYS:

Create and compare different graphical representations of data sets including using software where appropriate;

interpret the data in terms of the context.

WHAT THIS MEANS

Choosing and making the appropriate type of graph or table and describe it.

- Creating a graph by hand and using spreadsheets.
- It makes sense to collect and record data (3ST01) and then graph it (3ST02).
- <u>Different graphical representations;</u> selecting the appropriate graph will depend on the data. For example, the use of a line graph would be inappropriate for displaying data that has be counted.
- Interpret the data; interpreting data means that the students must explain what the data indicates. They could write a story or give a presentation.



9M 3ST03

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



A.C. VERSION 9 SAYS:

Conduct guided statistical investigations involving the collection, representation and interpretation of data for categorical and discrete numerical variables with respect to questions of interest.

TIP & RESOURCE

See ACARA's poster.

WHAT THIS MEANS

The students, with help, create, refine, conduct investigations (mostly

surveys), display the data and form conclusions.

Categorical data, is data that may be sorted into types or categories. (e.g. "eye colours in our class"). An interpretation of the data may be "most students in our class have blue eyes."

© Dr Paul Swan

Discrete means the data is counted not measured (e.g. "number of cars in the car park").

LINKING ST01, ST02 AND ST03

Elements of statistics this year:



© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.13

Quick Curriculum Guides • Year 3 9M 3P01

Probability > Language of Probability

A.C. VERSION 9 SAYS:

Identify practical activities and everyday events involving chance; describe possible outcomes and events as 'likely' or 'unlikely' and identify some events as 'certain' or 'impossible' explaining reasoning.

LANGUAGE EXAMPLES:

certain /uncertain

always / never

likely / unlikely

a chance / no chance

possible / impossible

WHAT THIS MEANS

 \bigcirc

Conducting simple chance experiments to develop probability language. Students make a choice out of a pair. Ordering probabilties is in Year 4.

© Dr Paul Swan

- Year 3 is the first time students encounter Probability.
- Practical activities; roll dice, flick spinners and pull items out of a bag to develop a feeling for chance. While this is happening, students are introduced to the language of chance. Students can then use this language to make predictions about potential outcomes.

RESOURCES & MANIPULATIVES



Spinners (round transparent spinners, suction spinners and plastic spinner arrows)



Probability Chance Experiments Middle Primary (Years 3 - 4)





Probability > Experiments

/ 3P02

 \bigcirc

© Dr Paul Swan



A.C. VERSION 9 SAYS:

Conduct repeated chance experiments; identify and describe possible outcomes, record the results, recognise and discuss the variation.

WHAT THIS MEANS

Students need to roll dice, flick spinners and record outcomes.

- Experiments will need to be performed more than once so that students realise the variability when flicking coins or rolling dice. Data from individual experiments can be compared with whole class data.
- Tallying and graphing the results of chance experiments ties in with 3ST01, 3ST02 and 3ST03.

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 (Years 3 - 4)



Spinners (round transparent spinners, suction spinners and plastic spinner arrows)



Heads or Tails by Tracey Muir



Classroom Dice Pack

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

Linked to AC9M3P01 Linked to Year 4 > AC9M4P02

© Dr Paul Swan • Quick Curriculum Guides • Year 3 • p.14