

Nau mai

haere mai



Hui 2 - Planning

Planning to activate all mathematical proficiencies

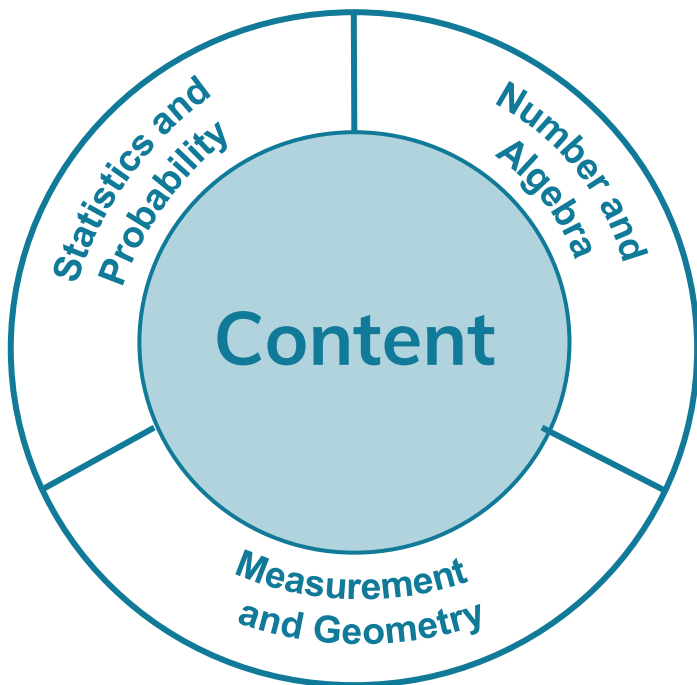
Adapted from Swafford & Kilpatrick

Procedural
Fluency

Calculate with precision
Estimate with reasonableness
Recall definitions/facts
Use appropriate methods & measures

Conceptual
Understanding

Recognise representations
Describe & express ideas
Connect related concepts
Predict outcomes, relationships



Productive
Disposition

Deduce & defend arguments
Form logical conclusions
Prove generalisations
Identify and explain patterns

Adaptive
Reasoning

Find & use a model
Solve & pose 'real' problems
Evaluate & adapt strategies
Justify reasonableness

Problem
Solving

See mathematics as worthwhile

Identify meaning in their world

Believe in one's own efficacy

Participate effectively in groups

1



NZMaths Planners



Long-term Plans : Units as a starting point

Planning space

Manage and create teaching plans.

[Long-term plans.](#)

Long-term plans

These long-term plans provide a starting point for planning a mathematics teaching programme for a year.

	Full-year plans	Plans, by term, in the Planning Space			
		Term 1	Term 2	Term 3	Term 4
Early level 1					
Late level 1					
Early level 2					
Late level 2					
Early level 3					
Late level 3					
Early level 4					
Late level 4					

Early and late Level 4

Term One	Term Two	Term Three	Term Four
Figure me out (Thematic Unit)	Getting partial to decimals Addition and Subtraction of decimals to three places)	Areas and volumes (Areas of quadrilaterals, and triangles, volumes of cuboids)	Representing 3D objects in 2D drawings (Geometry of 3D shapes, drawing 3D shapes in 2D)
Cuisenaire rod fractions: Level 4 (Ordering and comparing fractions)	Fitness or Tessellating art (Two dimensional shapes, angles, properties, tessellation)	Equivalent fractions (Equivalent fractions as numbers, fractions of sets, equal sharing)	Balancing Acts (Expressing relationships using algebraic symbols)
Cool times with heat (Measuring temperature)	What are the chances? (Probability)	Travel to school (Statistical inquiry cycle with category data)	Getting partial to fractions (Fractional numbers)
What's going on? Properties of multiplication and division. (Multiplication and division of whole numbers)	Down on the farm (Linear relationships, tables, graphs, equations, word rules)	Getting partial: Fractions of sets (Fractions as operators)	Oranges or Weighty Problems (Measurement of length, area, volume, capacity, mass)
Measuring up (Statistical Inquiry Cycle)	Matariki - Level 4 (Thematic Unit)	Marble roll (Measurement of length and time, relationships between variables)	Map It (Co-ordinates, Maps)

Term One	Term Two	Term Three	Term Four
Whakataukī (Thematic Unit)	All about angles (Measuring angles, reasoning with angles as measures of turn)	Integers (Integers)	Time Zones (Measuring time, calculating with 24-hour time)
Multiplication and Division Pick n' Mix 1 (Multiplication and division with whole numbers)	You can count on squares! (Area of rectangles and triangles)	Getting partial to percentages (Percentages)	X marks the spot (Cartesian co-ordinates, representing location)
Transformations (Symmetry)	How much bullying? (Statistical inquiry cycle, conducting surveys)	Solid Understanding (Properties of 3-D solids, nets of polyhedral, symmetry)	Flip and Roll (Probability)
Solving linear equations (Linear relationships)	Spaced out (Volume of cuboids, metric units of volume and capacity)	Getting partial: Multiplying decimals (Multiplication of decimals)	What's going on? Fractions (Ordering, adding, and subtracting fractions, mixed numbers)
Addition, subtraction, and equivalent fractions (Adding and subtracting fractional numbers, equivalent fractions)	Matariki – level 4 (Thematic unit)	Cubic Conundrums (Probability, growing patterns, drawing 3D models, volume of cuboids)	Choices (Representing linear relationships)

Setting up your own Planning Space

Planning space

Manage and create teaching plans.

[Long-term plans.](#)

Planning Space

Create, print and share your own teaching plans using nzmaths resources. You need to be logged in to use the planning space.



STEP 1

Log In to nzmaths



STEP 2

Create a new plan



STEP 3

Add details now
(or later) about
the plan



STEP 4

Search using the
Resource Finder or by
navigating the site



STEP 5

Add resources to
your plan



STEP 6

Print your plan and
download a zip file
of resources

Return to this page to manage your plans. For help with creating plans see the [help file](#).

Recap on using the resource Finder

Choose filters to find resources

Use Curriculum Levels

Use Numeracy Stages

Use LPF Aspects

Select which resource type(s) you are looking for

- Units of Work ?
- Rich learning activities ?
- Problem solving activities ?
- Numeracy activities ?
- Picture book activities ?
- Figure It Out activities ?
- Secondary activities ?

Select a level

Level Four



Select a strand

-Shape




Select an Achievement Objective

GM4-5: Identify classes of two- and three-dimensional shapes by their geometric properties.



- Include resources where this is a supplementary Achievement Objective ?

Recap on using the resource Finder

 Search



Fitness

Level Four | Geometry and Measurement | Units of Work

This unit examines regular tessellations, that is, tessellations that can be made using only one type of regular polygon, and semi-regular tessellations, where more than one type of regular polygon is involved. Students are required to investigate what properties tessellating shapes must have in...



Quadrilaterals

Level Four | Geometry and Measurement | Units of Work

In this unit we conduct a couple of investigations looking at the relationship between the angle between two diagonals of a quadrilateral, the sides of the quadrilateral, and the type of quadrilateral. The main emphasis is on rectangles.



Solid Understanding

Level Four | Geometry and Measurement | Units of Work

In this unit students make and investigate various solids, including regular and semi-regular polyhedra, and cylinders and cones. They look for patterns in the numbers of faces, edges and vertices they see whether they can “discover” Euler’s famous formula. By truncating the vertices of the Platonic...



Recap on using the resource Finder

Activity

Sessions 1 and 2

In these sessions the students review the names of basic geometric objects and learn to draw circles around rectangles.

1. Show students in a whole class setting, a variety of polygonal shapes for them to identify.
2. Assess their knowledge of basic concepts related to polygons such as square, rectangle, quadrilateral (any four sided polygon), kite, rhombus, vertices, edges, interior angles, diagonals.
What is this? (Show a rectangle.)
What is this part of a rectangle called (Point to vertices = corners, edges = sides.)
Where would I draw in a diagonal?
Describe a rectangle carefully.
Describe a square carefully.
What do these shapes have in common?
Is a square a rectangle? (Yes.)
What is a kite (rhombus)? What are its special features?
What shapes have more than one name? (A square is a rectangle, kite, rhombus; a kite is a rhombus)
3. Give the students time to make a poster with all of the different quadrilateral shapes on them.
4. Now concentrate on rectangles. Ask:
How would you draw any old rectangle?
How would you draw a rectangle with given side lengths?
5. Probably they would draw one side (with a given length); construct a right angled corner using a protractor; then measure the 'vertical' side and draw it in; repeat at the other side; join the two vertical edges to complete the rectangle. However, if they have used compasses they may be able to do this by constructing the right angles needed.

Recap on using the resource Finder

Home Link

Family and Whānau,

This week we have been investigating quadrilaterals (four sided shapes). Your child is working on a poster of the different quadrilaterals and their characteristics. Ask them to explain what they have found out this week and what information they are putting on their poster. Can they identify different quadrilaterals in their environment and name them? Can they teach you a new fact?

Add to plan

You are not currently using this resource on any of your plans.

Add this *resource* to one of your plans

- Select a plan -



[Create a new plan](#) that include this *resource* or manage your plans from your [planning space](#).

 **Printer-friendly version**

Level Four

Example templates to share

Planning examples

These case studies have been developed to illustrate authentic planning carried out in schools. They are not intended to represent a single 'best practice' model.

Year 1 and 2 long-term plan

This case study describes a hypothetical long-term plan for a year 1-2 syndicate. Includes links to all relevant teaching resources.

Year 8 long term-plan

This case study describes a hypothetical long-term plan for a year 8 syndicate. Includes links to all relevant teaching resources.

Year 9 and 10 cross-curricular planning

This case study describes Thames High School's process for developing cross-curricular units at levels 4 and 5. A collection of 7 units of work are also available.

A [collection of long term plans](#) at levels 1-4 have been developed to provide a **starting point** for planning a mathematics teaching programme for a year.

Long-term Plan: Rongopai Middle School

Long Term Planning Decisions

Our syndicate prioritises topics for units based on the following criteria:

1. Areas of mathematics and statistics identified in the data where achievement of our students is relatively weak.
2. Our collective knowledge about sensible sequences of learning experiences, for example, multiplicative thinking strongly supports understanding of equivalent fractions, decimals and percentages.
3. Interests of our students, and occasions that are significant cultural events for our school community, for example, Matariki is celebrated in late Term Two every year.

We did not include a statistical investigations unit of work in this plan as an investigation planned as part of a Health and PE unit on advertising and food choices provides an opportunity to notice students' capability in the two statistics aspects.

The [long term plan for terms one and two](#) (PDF, 101KB) includes hyperlinks to units of work; each unit is mapped against the aspects of the LPF, and against the strands and achievement objectives from the NZC. This was made by filling in the school's [long-term planning template](#) (docx, 19KB).

The sequence of units for term three and four will be determined late in term two and will be dependent on students' progress as well as the need to balance across aspects of the LPF. We anticipate that a focus on decimals, percentages, operations on fractions, decimals and percentages, geometry, statistical investigation and probability will be needed. For each unit, links to [other related resources and assessment suggestions](#) (PDF, 219KB) have been collected in a separate document.

Long-term Plan – using Units

School: Rongopai Middle School

Team: Rooms 5, 6, 7 (Tui Syndicate)

Year: Eight

Week	Term One	Term Two	Term Three	Term Four
1	Unit One Figure me out (Thematic Unit)	Unit Six All about angles		
2				
3	Unit Two Multiplication and Division Pick n' Mix 1	Unit Seven You can count on squares (areas of rectangles and triangles)		
4				
5		Unit Three What's going on? Properties of Multiplication and Division.	Unit Eight Getting Partial to Fractions of Sets	
6				
7	Unit Four Solving Linear Equations (Sequential and Growing Patterns)	Unit Nine Spaced Out by Volume		
8				
9	Unit Five Getting Partial to Fractions	Unit Matariki – Level 4 (Integrated Unit)		
10				
11				

Long-term Plan – using Units

LPF Aspect	Achievement Objectives	
Geometric Thinking	Level Three	<ul style="list-style-type: none"> Classify plane shapes and prisms by their spatial features. Represent objects with drawings and models. Use a co-ordinate system or the language of direction and distance to specify locations and describe paths. Describe the transformations (reflection, rotation, translation, or enlargement) that have mapped one object onto another. (10)
	Level Four	<ul style="list-style-type: none"> Identify classes of two- and three-dimensional shapes by their geometric properties. Relate three-dimensional models to two-dimensional representations, and vice versa. Communicate and interpret locations and directions, using compass directions, distances, and grid references. Use the invariant properties of figures and objects under transformations (reflection, rotation, translation, or enlargement). (10)
Measurement Sense	Level Three	<ul style="list-style-type: none"> Use linear scales and whole numbers of metric units for length, area, volume and capacity, weight (mass), angle, temperature, and time. (7, 9) Find areas of rectangles and volumes of cuboids by applying multiplication. (6, 7, 9)
	Level Four	<ul style="list-style-type: none"> Use appropriate scales, devices, and metric units for length, area, volume and capacity, weight (mass), temperature, angle, and time. (6, 7, 9, 10) Convert between metric units, using whole numbers and commonly used decimals. Use side or edge lengths to find the perimeters and areas of rectangles, parallelograms, and triangles and the volumes of cuboids. (7, 9) Interpret and use scales, timetables, and charts.

LPF Aspect	Achievement Objectives	
Statistical Investigations	Level Three	Conduct investigations using the statistical enquiry cycle: (10) <ul style="list-style-type: none"> gathering, sorting, and displaying multivariate category and whole-number data and simple time-series data to answer questions identifying patterns and trends in context, within and between data sets communicating findings, using data displays.
	Level Four	Plan and conduct investigations using the statistical enquiry cycle: (10) <ul style="list-style-type: none"> determining appropriate variables and data collection methods gathering, sorting, and displaying multivariate category, measurement, and time-series data to detect patterns, variations, relationships, and trends comparing distributions visually communicating findings, using appropriate displays.
Interpreting statistical and chance situations	Level Three	<ul style="list-style-type: none"> Evaluate the effectiveness of different displays in representing the findings of a statistical investigation or probability activity undertaken by others. Investigate simple situations that involve elements of chance by comparing experimental results with expectations from models of all the outcomes, acknowledging that samples vary.
	Level Four	<ul style="list-style-type: none"> Evaluate statements made by others about the findings of statistical investigations and probability activities. Investigate situations that involve elements of chance by comparing experimental distributions with expectations from models of the possible outcomes, acknowledging variation and independence. Use simple fractions and percentages to describe probabilities.

Weekly Plans - ideas

NZ Maths / Families and whānau / Learning at home / Weekly plans

Weekly plans

Go to the school year appropriate to the child. Click on a button to view each week plan.
If the plan is too easy or too hard, move up or down a school year to find one that best suits.

Year 1

[1:1](#) Number knowledge and Geometry | [1:2](#) Number knowledge and Measurement | [1:3](#) Number knowledge and Patterns | [1:4](#) Number knowledge and Probability | [1:5](#) Number

Year 2

[2:1](#) Number knowledge and Geometry | [2:2](#) Number knowledge and Measurement | [2:3](#) Number knowledge and Patterns | [2:4](#) Number knowledge and Probability | [2:5](#) Number

Year 3

[3:1](#) Number knowledge and Geometry | [3:2](#) Place value and Measurement | [3:3](#) Number facts and Patterns | [3:4](#) Number knowledge and Probability | [3:5](#) Number

Year 4

[4:1](#) Number knowledge and Geometry | [4:2](#) Place value and Measurement | [4:3](#) Number facts and Patterns | [4:4](#) Number knowledge and Probability | [4:5](#) Number

Year 5

[5:1](#) Number knowledge and Geometry | [5:2](#) Place value and Measurement | [5:3](#) Number facts and Patterns | [5:4](#) Fractions and Probability | [5:5](#) Number

Year 6

Weekly Plans - ideas

Year 5 week 1 (number knowledge and geometry)

This week we focus on improving your knowledge of number facts and your understanding of 2-D and 3-D shapes in geometry.

This page suggests activities for each day. Click to [download a printable PDF](#) to help keep track of progress.

Day 1

Number facts activity

- Go to the activity [Multiplication 2s, 5s and 10s - test yourself](#) and follow the instructions for the variation.
- Keep the pile of facts you don't yet know somewhere safe.

OR

Number facts e-ako

The aim of the number facts learning tools are to improve your recall of facts so that you can use them to solve problems. The tools work by first finding out the facts that you know and then teaching you facts that you don't know.

There are two tools. One builds addition and subtraction facts and one builds multiplication and division (times tables).

We suggest that you start with the addition and subtraction tool and move to the multiplication one when you can answer all the addition and subtraction facts quickly.

- Go to the number facts pathway in [e-ako maths](#).
- Choose the addition and subtraction learning tool.
- Click "Check all facts" and answer the questions. The green ticks show the facts you know.
- If you know all of the facts then tomorrow move onto the multiplication and division tool.

Geometry e-ako

- Go to the geometry pathway in [e-ako maths](#).
-

WEEKLY PLANNER

Y5

Week 1 (number knowledge and geometry)

This week we focus on improving your knowledge of number facts and your understanding of 2-D and 3-D shapes in geometry.

DAY 1

Number facts activity

- Go to the activity [Multiplication 2s, 5s and 10s – test yourself](#) and follow the instructions for the variation.
- Make a learning pile of facts you don't yet know.
OR

Number facts e-ako

- Go to the number facts pathway in e-ako maths.
- Choose the addition and subtraction learning tool.
- Click "Check all facts" and answer the questions. If you know all of the facts, move onto the multiplication and division tool.

Geometry e-ako

- Go to the geometry pathway in e-ako maths.
- Choose e-ako G3.10 (1st yellow button; 3rd row)
- Work through pages 1–9.

Geometry activity

- Go to the activity [Tricky Triangles](#) and complete it.

DAY 2

Number facts activity

- Select 2-3 new multiplication facts in your learning pile to practice today.
- Ask a family member to test you.
OR

Number facts e-ako

- Go back to the addition and subtraction learning tool.
- Click "Learn a new fact" and complete 3 mini lessons.
- Click "Check recent facts" and answer the questions.
- Return to the number facts pathway and select one of the games, below the tool, to play.

Geometry e-ako

- Go back to e-ako G3.10 on the geometry pathway.
- Work through pages 10–15.

Geometry activity

- Go to the activity [The Seven Stars of Matariki](#) and answer the questions.

DAY 3

Number facts activity

- Go to the activity [Division 2s, 5s and 10s – test yourself](#) and follow the instructions for the variation.
- Add the facts you don't yet know to your learning pile.
OR

Number facts e-ako

- Go back to the addition and subtraction learning tool.
- Click "Learn a new fact" and complete 3 mini lessons.
- Click "Check recent facts" and answer the questions.
- Return to the number facts pathway and select one of the games, below the tool, to play.

Geometry e-ako

- Go back to e-ako G3.10 on the geometry pathway.
- Work through pages 16–21.

Geometry activity

- Go to the activity [Shapes in life](#) and follow the suggestions.

DAY 4

Number facts activity

- Select 2-3 new multiplication or division facts in your learning pile to practice today.
- Ask a family member to test you.
- Go to the activity [Multiplication Loopy](#) and follow the instructions.
OR

Number facts e-ako

- Go back to the addition and subtraction learning tool.
- Click "Learn a new fact" and complete 3 mini lessons.
- Click "Check recent facts" and answer the questions.
- Return to the number facts pathway and select one of the games, below the tool, to play.

Geometry e-ako

- Go back to e-ako G3.10 on the geometry pathway.
- Work through pages 17–26.

Geometry activity

- Go to the activity [PostIt](#) and work through activity 1.

DAY 5

Number facts activity

- Go to the activity [Times Tables Practice](#). Read the instructions and challenge someone in your family to a game!
OR

Number facts e-ako


- Go back to the addition and subtraction learning tool and "Check all facts" again.
- Return to the number facts pathway and try to beat your score on one or more of the games you've played.


Geometry e-ako


- If you like, work way through e-ako G3.10 on the geometry pathway again. Select "reset" instead of "start" on the pathway page.

Geometry activity

- Go to the activity [Cutting Corners](#) and complete the activity. Remember you could look in your recycling bin for cardboard.

 independent

 supported

 interaction

Download the activities or follow the links on:
<https://nzmaths.co.nz/year-5-week-1>

nzmaths.

2



Other ideas

Dr Paul Swan

A Guide to... TEACHER PLANNING



1 The Year

Get an overall feel for the Year level(s) you will be teaching. Consider also that with various interruptions you may only have 28-30 effective weeks in the year.



2 The Term

This guide contains a term planner. It's recommended that Term 1 begins with a review of the previous year, some assessment and the establishment of routines. Term 2 includes report writing as does Term 4, so it's always a good idea to reserve some easier topics or revision for these periods.

3 The 4-Week block

The 4-week block is block of time within the term filled with a collection of lessons that connect to each other. Using 4-week blocks helps in planning, making connections and review/assessment.

4 The Unit of Work (series of lessons)

Some topics will require several lessons in order for students to best understand a concept. **Curriculum Threads Charts** can assist in developing units of work.



5 The Lesson

The lesson is where your planning is put into action. Having a lesson plan can improve student outcomes and make planning easier.

5. The Lesson

Research has proven that planning lessons that are taught improves that chance students will learn the concept being taught. Sullivan (2011) presents 6 key principles specifically for the teaching of mathematics in his curriculum framing paper. A more general set of principles known as the High Impact Teaching Strategies (HITS) operate across all learning areas. Of the 6 Sullivan principles below, the starred ones **also** appear in research about HITS. These principles could therefore be considered extremely important.

1. Articulate goals ★

- Explain the purpose of the lesson to students and ensure they know what they are expected to do.

2. Making connections (build on what you know)

- Make explicit connections to previous content. This is easier if you link units of work where possible.

3. Fostering engagement

- Student engagement involves more than just the students looking at the teacher. Engagement can be fostered when activities provide a challenge for the students. Choice and relevance to daily life also play a part in engaging students. Catherine Attard's website engagingmaths.com illustrates three components of engagement.

4. Differentiating challenges

- You cannot teach 32 individual lessons at once. What you can do is take an activity and alter the content, the process or the product to differentiate it for varying abilities.

5. Structuring lessons ★

- Following a lesson structure keeps things moving and ensures important elements aren't missed.

6. Promoting fluency and transfer (practice) ★

- Sullivan recommends fluency lessons and then regularly-spaced practice, sometimes referred to as warm ups and mental maths. See **Milestones** (below) for basic fact fluency support.

Plan to reactivate, practice and deepen key concepts

NZMaths Unit Plans

5 lessons
over 2 weeks

Rapid Routines

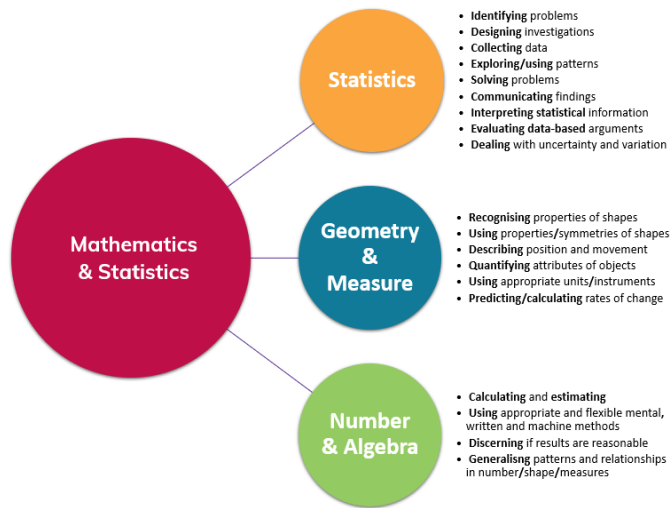
3 x 10 min
each week

	Concept	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10
Number & Algebra	Number Strategies	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow	Yellow
	Number Knowledge (place value)	Green	Green	Yellow						Yellow	
	Number Knowledge (frac%/ratios)	Yellow			Yellow		Yellow	Green	Green		Yellow
	Equations and expressions		Yellow	Green	Green						
	Patterns and relationships			Green	Green			Yellow			
Measurement and Geometry	Measurement (conversions)								Yellow		
	Measurement (length, mass)		Yellow								
	Measurement (angles)								Yellow		
	Measurement (time)					Yellow					
	Measurement (perimeter & area)									Yellow	
	Measurement (volume)						Yellow				
	Shape	Yellow				Yellow					
	Position and direction				Yellow						
	Transformation							Yellow			
Statistics	Statistical Investigations					Green	Green			Yellow	
	Statistical literacy				Yellow	Green	Green				
	Probability			Yellow							

The key ideas and elaborations for each sub-strand

What do we do?

THE LEARNER FIRST™



Level 3 Key Ideas and Elaborations (Number and Algebra)		
Number Strategies – key ideas	Number knowledge – key ideas	Equations & Expressions – key ideas
<p>Numbers can be partitioned and combined to solve more complex (multi step) addition and subtraction and simple multiplication and division problems eg $53 - 28$; $53 - 30 = 23$, $23 + 2 = 25$ $43 - 38$; solve as $38 + \square = 43$ if I know $5 \times 5 = 25$ then I know 6×5</p>	<p>Numbers can be represented in a variety of ways incl fractions, decimals and percentages for representing small numbers. The fraction $\frac{3}{4}$, 4 is division of equal parts, 3 is no. of the parts Decimals extend the PV system. Each column to the right of point is worth ten times less (a tenth of) Percentages thought of as fractions (out of 100 parts)</p>	<p>Equations show relationships of equality between parts on either side of the equal side. Working with $4 \times 5 = 10 + 6 + 4$ helps students understand = is "same as", equal to. Students record formal equations</p>
Number Strategies – elaborations	Number knowledge – elaborations	Equations & Expressions – elaborations
<p>NA3-1 A range of mental strategies including, standard PV $603 - 384 = \square$ as $60 - 38$ tens less one (219) round/compensate $923 - 587 = \square$ as $923 - 600 + 13 = \square$ reverse (apply inverse) $923 - 587$ as $587 + \square = 923$ Distributive e.g., 13×6 as $10 \times 6 + 3 \times 6$ Associative e.g., 14×9 as $2 \times (7 \times 9) = \square$ Inverse e.g., $36 \div 9$ as $4 \times 9 = 36$ $2/3$ of 24 as $24 \div 3 \times 2 = 16$, $\frac{3}{4} = 6/8$, $\frac{3}{4} + \frac{3}{4} = 6/4$, $17/3 = 5 \frac{2}{3}$</p> <p>Know conversions of halves, quarters, fifths, tenths and use them to solve % of amounts e.g., 50% of 18 = half of 18 = 9</p>	<p>NA3-2 Know from $0 \times 0 = 0$ to $9 \times 9 = 81$ and all division. Commit to memory when the understand meaning of = and use properties to work them out eg "Eight sets of seven" can be worked out by 4×7 and doubling it. Know $56 \div 7$ is both 56 shared among 7 and how many 7s in 56 NA3-3 Know fwd 0,1,2, 3. and bwd 1 000 000, 999 999, 999 998 Know multiples of one, ten, hundred, thousand 1250, 2250 ... Know 701 000 results in 691 000 if 10 000 is taken from it. Know sequences in tenths e.g., 4.7, 4.8, 4.9, 5... NA3-4 Have a multiplicative view of whole number place value. Understands the nested view e.g., 239 456 has 23 ten thousand, 2394 hundreds, and 23 945 tens. Best demonstrated by 2004 – 700, so 20 hundred take 7 hundred Know one hundred thousand is ten times as much as ten thousand, and one hundred is result of dividing one thousand by ten. Eg 4200 is ten times more than 420, 43 divides by 10 is 4.3 NA3-5 Fractions are repeats of a unit fraction e.g., $\frac{3}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$. Fractions can be greater than 1 whole e.g., $\frac{5}{3} = 1 \frac{2}{3}$, they have counting order if denominator is the same. The size of the denominator affects the size of the parts. Eg $\frac{2}{7} < \frac{2}{5} < \frac{2}{3}$. Know simple common fraction/% e.g., $\frac{1}{5} = 50\%$, $\frac{1}{10} = 10\%$, $\frac{1}{5} = 20\%$ and use this to work out non-unit fractions as % e.g., $\frac{3}{4} = 75\%$</p>	<p>NA3-6 Explain and record strategies using words, symbols and diagrams. Recording reduces working memory, useful for complex, multi-step problems. Know which operation to use on a calculator if numbers beyond their mental ranges. Familiar with empty number lines (add/sub), arrays (mult/div), double number lines (fractions and %)</p>
Patterns and relationships – key ideas		Patterns and relationships - elaborations
<p>Patterns and relationships can be used, represented and generalised in a variety of ways. Students need to be challenged to identify patterns and relationships, and then explore to see if they can be generalised, including the use of tables. Students will use multiplicative strategies to determine the nth term in repeating patterns Eg RBBYRBBYRBBY, so the fourth term is yellow, 4 elements in repeat, every multiple of 4 will be yellow, one and two less than every multiple of 4 will be B, three less will be R. Students will generate patterns e.g., amount saved weekly is multiplied by no. of weeks and added to the beginning amount-shown in a table and graphically.</p>		<p>NA3-7 Students will generalise; this begins with noticing patterns/rships, defining the variable. This helps them perform mental strategies eg commutative $7 \times 8 = 8 \times 7$, associative $(2 \times 3) \times 4 = 2 \times (3 \times 4)$, distributive $8 \times 7 = 8 \times 5 + 8 \times 2$, inverse $6 \times 7 = 42$ so $42 \div 7 = 6$, identifies for all four operations e.g., $17 \times 1 = 17$, $17 \div 1 = 17$ Not expected to use algebraic symbols but look for rships to determine missing numbers Eg $4 \times 12 = \square \times 6$ without calculating. NA3-8 Increasingly sophisticated at describing rship between variables in sequences. In spatial patterns, identify repeating element & predict shape using multiplicative thinking. In number patterns, identify consistent rship between variables. Describe rules in their words and find rules to find further terms. Use tables, graphs, diagrams.</p>

Keep shape concepts alive in Year 7/8

Rapidroutines



- 2 or 3 procedural questions
- 2 or 3 times a week
- Whole class on whiteboards
- Teacher facilitates
- One question chosen
- Whole class “DiscussnDefend”

Keep place value concepts alive in Year 7/8



Rapidroutines

Level 3 Key Ideas and Elaborations (Number and Algebra)
Number knowledge – key ideas
Numbers can be represented in a variety of ways incl fractions, decimals and percentages for representing small numbers. The fraction $\frac{3}{4}$, 4 is division of equal parts, 3 is no. of the parts Decimals extend the PV system. Each column to the right of point is worth ten times less (a tenth of) Percentages thought of as fractions (out of 100 parts)
Number knowledge – elaborations
NA3-2 Know from $0 \times 0 = 0$ to $9 \times 9 = 81$ and all division. Commit to memory when the understand meaning of = and use properties to work them out eg "Eight sets of seven" can be worked out by 4×7 and doubling it. Know $56 \div 7$ is both 56 shared among 7 and how many 7s in 56 NA3-3 Know fwd 0,1,2, 3. and bwd 1 000 000, 999 999, 999 998 Know multiples of one, ten, hundred, thousand 1250, 2250 ... Know 701 000 results in 691 000 if 10 000 is taken from it. Know sequences in tenths e.g., 4.7, 4.8, 4.9, 5... NA3-4 Have a multiplicative view of whole number place value. Understands the nested view e.g., 239 456 has 23 ten thousand, 2394 hundreds, and 23 945 tens. Best demonstrated by 2004 – 700, so 20 hundred take 7 hundred Know one hundred thousand is ten times as much as ten thousand, and one hundred is result of dividing one thousand by ten. Eg 4200 is ten times more than 420, 43 divides by 10 is 4.3 NA3-5 Fractions are repeats of a unit fraction e.g., $\frac{3}{5} = \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$. Fractions can be greater than 1 whole e.g., $\frac{5}{3} = 1 \frac{2}{3}$, they have counting order if denominator is the same. The size of the denominator affects the size of the parts. Eg $\frac{2}{7} < \frac{2}{5} < \frac{2}{3}$. Know simple common fraction/% e.g., $\frac{1}{5} = 50\%$, $\frac{1}{10} = 10\%$, $\frac{1}{5} = 20\%$ and use this to work out non-unit fractions as % e.g., $\frac{3}{4} = 75\%$

Monday	Wednesday	Friday
How many tens altogether in 450?	How many hundreds altogether in 15 000	How many tenths altogether in 1.5?
What number comes next? 1250, 1150, 1050, ?	What number comes next? 0.7, 0.8, 0.9, ?	What number comes next? 10 200, 10 100, 10 000
What has been added to 750 000 to make 850 000?	What has been subtracted from 1 000 000 to make 100 000?	What has ten thousand been divided by to make one hundred?
Choose one question where ākonga have opportunities to communicate and share their thinking, their methods, their language. Kaiako can use insights to assist future planning of questions.		

Many sources we use including...



Any recommendations?