



The Wilkie Way

Newsletter May 2021

www.wilkieway.co.nz

Measuring Progress in Learning

Accountability has the natural tendency to force people to prove themselves by providing measureable evidence. However, learning is not so easily measurable as it is personal and dependent on so many different things. It has been shown there is more variation within a single student than across a class of students.

True learning is something that is achieved over time and with effort on the part of the learner and the support and challenge from the teacher. But we are still required to measure progress.

There are 10 key findings for making a bigger difference in mathematics teaching
(Derived from a range of national and international monitoring data and research including NEMP, TIMSS, PISA, ERO and 103 NDP evaluations & studies)

Key Finding number 6

Assessment for Learning:

Effective teachers make use of a wide range of formal and informal assessments to monitor learning progress, diagnose learning issues and determine what they need to do next to further learning. **IN THE COURSE OF REGULAR CLASSROOM ACTIVITY** they collect information about students learning. Moment by moment assessment of student progress helps decide what questions to ask, when to intervene and how to respond to questions. Teachers gain a lot by observing and listening. **A TEACHER SHOULD NOT BE TALKING ALL THE TIME.**

One on one interviews can also provide important insights. A thinking aloud problem solving interview will often reveal more about what is going on in a student's mind than a written test.

By asking questions, effective teachers require students to participate in mathematical thinking and problem solving. A key indicator of good questioning is how a teacher listens to student responses. Effective teachers pay attention not only to whether an answer is correct but also to the students' mathematical thinking. Teachers need to have an understanding of the thinking progressions as manifested in the mathematics being undertaken by the students. Progressions and frameworks strengthen teacher knowledge of student thinking.

Advice given on NZMaths under tracking progress and achievement:

Teachers are encouraged to plan opportunities to notice what their students can do in their regular teaching and learning programmes. This may involve identifying specific activities that provide a rich source of information about how students are going on key learning outcomes. By observing students as they work in class, asking probing questions, listening to explanations, and looking at students' workbooks, teachers can determine what students know and can do. They can use this information to improve the teaching and learning of mathematics and to make judgments about achievement. The most authentic assessment tasks are those that are included in the learning experiences of the students, rather than as stand alone tests.

In addition to noticing what students know and can do in teaching and learning programmes, there are a range of assessment tools available to collect particular information about students, **as required.**

Use an assessment tool only for specific students or for a specific reason that will be for the benefit of the students progress.

What Assessment Tools are available for Mathematics

There is no ministry approved assessment tool (only ministry funded).
It is up to schools and individual teachers to decide which tool is going to give them the extra information they require.

Assessment Tool	Year Groups	Assessment Type
Progressive Achievement Tests (PAT)	year 3+	Multi choice
e-asTTle	Year 5+	Multi choice
GloSS	year 3+	Individual Interview
JAM	Year 1 - 3	Individual Interview
Numeracy Baseline	Year 0 - 1	Evidence collected over period of time: Language and basic number knowledge
Primary Maths Assessment Tool (PMAT) (Level 1 sections 1 & 2)	Year 1 - 2	Individual Interview Early knowledge & simple problems
Primary Maths Assessment Tool (PMAT) (Upper Level 1 to Early Level 3 (sections 3 & 4)	Year 2 - 6+	Problem solving: Small group guided paper recording)
Primary Maths Assessment Tool (PMAT) (Level 3 - 4 sections 5 & 6)	Year 6 - 10	Problem solving: Individual recording & conferencing
Wilkie Way Assessment Screens Level 1 - 4	Year 3 - 10	Key knowledge and skills. Recorded

Numeracy Baseline available FREE at www.wilkieWAY.co.nz Maths News & Information
Use the Assessment TAB or Foundation Years TAB to locate the downloadable file.

Primary Maths Assessment Tool (PMAT) available from edify.co.nz

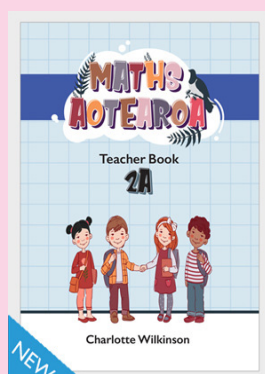
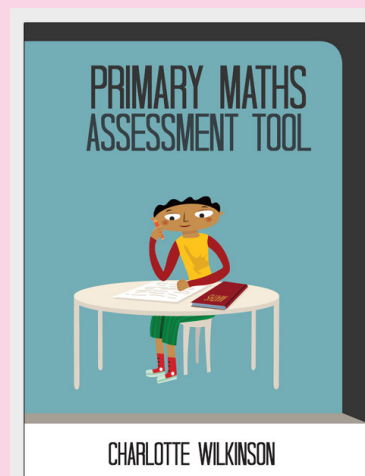
Wilkie Way Assessment Screens

available from the online store at wilkieWAY.co.nz

GloSS & JAM available from NZMaths website Tracking Progress & Achievement/Assessment Tools

Progressive Achievement Tests (PAT) information available from NZCER website

e-asTTle - information available from TKI website



Pearson Mathematics & Maths Aotearoa have mini projects designed to also be used as assessment tasks, with assessment criteria identified.

Maths Aotearoa also identifies the learning progression the mini project could provide evidence for.
(Available from edify.co.nz)

Resources for Wilkie Way Members

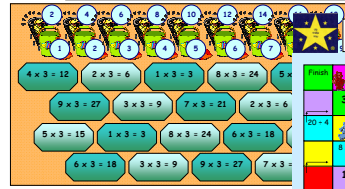
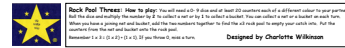
Subscriptions purchased at the online store at www.wilkieaway.co.nz
 Individual \$45 - paid via paypal
 NZ School paid via invoice - complete form at online store
 Up to 100 students \$150+GST
 101 - 300 students \$250 + GST
 300+ students \$350 + GST
 Non NZ School \$400 - paid via paypal



New Resources

Numeracy Games:
 New Folder: Multiplication and Division Games
 17 games have been added to this folder.
 Some of these games need 0 - 9 dice

Problems with Shopping can be downloaded as a single sheet from Graduated Problems on a Theme



May Featured Resources

Teacher Professional Resources: Learning Progressions

This learning progression chart assists teachers to see how the progressions that unpack all the strands of the NZ curriculum (and sit behind the PACT tool) progress from level 1 to level 4 (read horizontally) and how they connect with each other. (Read vertically). An essential chart for implementing the curriculum.

A Wilkie Way interpretation of the learning progressions to assist the moderation of students work against curriculum levels				
Level 1	Level 2	Level 3	Level 3	Level 4
Additive Thinking				
Set 1 Recognises 1, 2, 3 by subtracting	Set 2 1 - 1 matching Makes a set up to 10. Subitizes patterns to 6	Set 3 Counts all by imaging Draws picture of problem Solves real and change unknown problems	Set 4 Counts on to solve problem in range to 100. Uses number line to track	Set 5 Can +/- 10 from any number Uses partitions to 10. Uses doubles, uses +/- patterns based on facts to 10, knows standard place value partitions Knows decade numbers work like 10
Multiplicative Thinking				
Set 1 Recognises equal groups, makes word 'same' to mean equals	Set 2 Recognises equal groups and counts all to say how many altogether. Can share into equal groups.	Set 3 Uses skip counting or repeated addition. Recognises 1/4 as four equal groups.	Set 4 Understands multiplication is commutative. Recognises an array represents multiplication Recalls $2 \times 5 = 10$ Derives $x6, x7, x8$ Understands fractions as a result of a division	Set 5 Has recall of multi/div facts Uses $x10$ and basic facts Understands relationship between multiplication, division and fractions
Patterns and Relationship				
Set 1 Copies a simple repeating pattern Given 2 choices	Set 2 Can identify what is next in a pictorial pattern. Can create and describe a repeating pattern about a b repeating pattern	Set 3 Can identify the unit of repeat and continue the pattern. Can describe an element of a pattern in relation to its ordinal position. Can continue a growing spatial pattern and describe the number sequence. Can continue and grow a sequential number pattern.	Set 4 Can connect elements of a sequential pattern and recognise their ordinal position. Uses a table. Explains relationships between numbers.	Set 5 Creates & uses a table to collect information. Shows information in a graph. Can give a rule in words to describe the pattern.
Using Symbols and Expressions				
Set 1 Can read numerals 0 - 10 Knows operation words & symbols Knows word equal	Set 2 Can read numerals 0 - 10 Uses + = to represent an addition or subtraction situation. Can make up a number story for a + or - equation.	Set 3 Can represent a repeated + statement with a statement. Can represent a sharing situation with + statement Uses + Uses = to show equivalent expressions	Set 4 Can record an additive equality statement involving change unknown & knows it can be solved by subtraction. Can record a multiplicative equality statement involving change unknown and knows it can be solved by division.	Set 5 Solves problems using algebraic convention of a letter symbol understanding the letter can represent a single value in an equation. Can express a ratio and understands proportional relationships. Understands 'of' as x
Geometric Thinking				
Set 1 Becoming aware of shape and space. Can complete sorting toy, single piece jigsaws. Can follow instructions using traditional language	Set 2 Can sort by appearance Names common shapes Uses 1/2 and 1/4 turns, left & right Has some understanding of reflection	Set 3 Uses compass points and simple grid references Identifies shapes based on their features Understands ideas of reflection & rotation Can build 3D models from 2D diagrams Can recognise different viewpoints	Set 4 Knows names and properties of shapes. Can draw a net of a 3D shape. Can use a ruler and compass to draw accurate shapes. Can interpret different elevations/perspectives Can explain reflective and rotational symmetry using precise geometric language	Set 5 Understands interior angles. Recognises mathematical relationships between faces, edges, vertices. Uses correct mathematical terms. Understands and visualises cross sections in different angles. Uses bearings, compass directions and grid references using x and y axis. Uses scales on a map.
Measurement Sense				
Set 1 Understands attributes of weight. Can directly compare two objects. Uses language of comparison	Set 2 Can compare & order. Can use indirect measure. Uses balance scales. Can use a repeated unit without gaps or overlaps.	Set 3 Understands measure as a repeat of a single unit in length, weight & capacity. Can read a kg scale. Reads all whole number scales.	Set 4 Can create and use a measurement scale. Can use a ruler - uses in m & cm. Can read a kg scale.	Set 5 Can read intervals on a scale that are not numbered. Can calculate perimeter. Understands any point on a scale can be used as zero. Uses an array to calculate area. Can use x and + to calculate volume. Can find area of shapes by creating rectangles. Can find areas of triangles using the property of rectangles. Calculates volume using side measurements and multiplications Knows 1L of water weighs 1kg
Statistical Investigation				
Set 1 Participates in an investigation but unable to express reasoning.	Set 2 Can identify own data in a data set. Can interpret a pictogram based on the data. Can sort by one attribute.	Set 3 Can collect appropriate data to answer a question. Can create a dot plot, bar graph. Can interpret information from a dot plot or bar graph.	Set 4 Can pose an investigative question based on a set of data. Can create stem & leaf, tally, dot plot & bar chart to display findings and reach a conclusion. Can make conjectures based on the data. Can organise data in a table. Can use excel to create a graph.	Set 5 Can pose a question requiring collection of multivariate data. Uses excel to create bar graphs to analyse data. Communicates findings, draws conclusions and gives reasons related to the context. Can collect and display time series data. Can identify patterns within, between and beyond the data.
Interpreting Statistical and Chance Situations				
Set 1 Recognises certainty & uncertainty relative to an event. Can identify a statement about a data display as correct or incorrect.	Set 2 Understands that different outcomes are possible. Can identify a statement about a pictogram and use the data display to explain a reason.	Set 3 Can identify errors in data displays. Can identify erroneous statements made about a data display. Can explain why some outcomes are more or less likely. Can identify the necessary features of a graph (title, labels)	Set 4 Can evaluate the appropriateness of conclusions based on the data and data collection process. Can make suggestions on appropriateness of data displays. Can evaluate conclusions and recognise consistency in process of data collection.	Set 5 Evaluates data display information by critiquing the process used to gather and display the data and recognises how the process can impact on conclusions drawn. Critically evaluate and analyse conclusions with reference to the data in representing a situation. Uses theoretical models of chance.

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For further unpacking progressions of learning there are progressions for:

- Addition & Subtraction
- Multiplication & Division
- Fractions
- Place Value
- Number Operations (Previous four combined) by curriculum level
- Geometric Progressions
- Measurement Progressions



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Problems with Shopping

Tyler had \$10



He bought a drink and a doughnut and had no money left.

How much could each item have cost?

Sita went shopping and bought three items costing \$25, \$18 and \$43

How much did she spend altogether?

What is the difference in price between the most expensive and the cheapest item?



The shopping bill came to \$234



Only \$168 was for food. The rest was spent on a present for mum.

How much was the present?

Leila loves shopping.

She had saved \$250 to go on a shopping trip.

She wanted to buy 3 items costing \$48.50 \$78.95 \$105.75

Does she have enough money and if so how much change would she have?

