



The Wilkie Way

Newsletter October 2026

www.wilkieway.co.nz

Where has problem solving gone?

Our current curriculum seems to have pushed problem solving on to a back bench in order to prioritise the acquisition of knowledge and procedures.

Successful problem solvers require deep mathematical knowledge. Students need to be taught procedures, for example written algorithms for the four operations. When they need to do a calculation within a problem, they need to be able to relieve the thinking load on the brain to allow for reasoning and critical thinking.

However, knowledge and procedures alone will not create the problem solvers that the world requires to function in an ever increasingly complex world.

Problem solving is a messy business, with the solver moving forwards and backwards, reasoning, making connections and working their way towards a solution. Procedures allow students to only solve familiar problems and most problems encountered in the real world are unfamiliar problems. Technology (including AI) can be used to carry out most mathematical procedures. However the result provided by technology must be checked to see if it is reasonable. To check if calculations are reasonable students need to be able to make estimates. A reasoned estimate requires, at the most basic level a conceptual understanding of the number system and recall of addition, subtraction, multiplication and division facts.



A major part of problem solving is in the reading and comprehension of the problem.



Reading comprehension continues to be the biggest barrier for mathematical success. The ability to cope with a wide range of text requires more than the ability to read the words. It requires a full understanding of the key concepts underpinning ideas and the ability to interpret a variety of symbolic, spatial and quantitative texts. Mathematical texts require a very different approach than narrative reading. They must read closely, with attention to every word, because even the smallest words which are often insignificant in narrative text may be important in determining the solution to the problem.

When approaching a word problem students use two specific pathways to make sense of the text:

1. A direct translation approach
2. A problem model approach

In the direct translation approach the solution is based on key words. When the text is processed, students focus only on the numbers and the keywords ignoring most other information.

This approach makes minimal demands on working memory and is erroneously favoured by teachers, especially when reading comprehension is low. A keyword approach to problem solving prepares students for solving only a small set of clear predictable problems. Unfortunately the majority of problems encountered in the real world do not come neatly presented with key words telling you how to solve them. A problem model approach requires the student to construct a mental model of the situation focusing on how the parts of the problem are related. It is difficult if not impossible to create a model of a problem if the context is too far outside the experience of the solver. Drawing a picture, acting it out are ways of creating a model of the situation.

In addition to reading and comprehending words, students need to know how to interpret the unique symbols that make up the shorthand of mathematical statements, such as numerals, operation signs and variables that stand in for numbers, and equality and inequality symbols representing the relationships between quantities.

Using symbols with understanding is a complex process. When encountering mathematical symbols students face a multi level decoding process: Firstly they need to recognise and separate out the confusing mathematical symbols ($+$, $\times$, $-$, $\div$, $=$, $<$, $>$, $\neq$, $\leq$, $\geq$, ∞) without any phonic clues. Next they need to translate each symbol into English (or Te Reo), then they need to connect the symbol to the concept it represents. Finally they need to carry out any operation indicated and use any relationship indicated in the equation.

Developing the mathematical vocabulary essential for reading mathematical texts (a useful addition in our new curriculum) requires students to be involved in mathematical discussions.

**Talking is only half the equation when developing mathematical language skills.
Students must also learn to be effective listeners.**

Students need to know the expectations and have a clear purpose for listening. Students need to learn to discriminate between the important and less important information presented in teacher talk. A teacher's non verbal behaviour has the biggest impact on students' discriminative listening. This may include, but is not limited to re-reading, writing a word or phrase on the board, pointing to a chart or visual that shows information, or even just leaning forward when working with small groups.

A teacher just reading the information off a slide show presentation will not engage the student in the type of listening required to learn.

Efferent listening is required for students to take away information. However there is a limit to how long a person can engage in efferent listening without "tuning out", unless they are also a participant in talking or other action.

Teachers help students listen efferently by explaining the purpose of the activity, keeping them involved in the activity and engaging them in some action. (On screen action doesn't appear to have the same effect on supporting efferent listening, it is more likely to cause a distraction.)

Active participation in mathematical conversations is important for the development of mathematical understanding and the development of mathematical vocabulary. The teacher must learn to be an active listener when students are talking to each other as well as directly to the teacher. It is during listening time teachers can pick up misconceptions and understand how to develop their students knowledge and mathematical thinking further.



Mathematical knowledge and conceptual understanding are essential for problem solving and students need to be given the opportunity to use their mathematics. As my eleven year old daughter told me, "You only know if you have learnt something when you need to use it again."



Wilkie Way Membership - annual subscriptions

School membership - via invoice

Under 30 students \$65 + GST
 31 to 100 students \$180+GST
 101 - 300 students \$290 + GST
 301- 500 students \$400 +GST
 501 - 700 students \$520 + GST
 701+ students \$630 + GST
 Non NZ School \$750 - paid via paypal

Individual Membership

\$60.00
 payable via Paypal



Problems with Pegs Solutions & Notes

There were 12 pegs in a bag.
 The pegs were blue, red and yellow.
 How many of each colour could there be in the bag?
 This is problem of joining and partitioning with multiple solutions. encourage students to find at least two different possibilities.
 Turn it into an equal sharing problem by stating there is the same number of each colour.

Mum hung 10 teatowels on the washing line.
 How many pegs did she use?
 Can you describe a rule so you could say how many pegs are used for any number of tea towels hung on the washing line?

Students may draw out all ten tea towels and reach a solution for this problem.
 Show students how to use a table to look for a pattern and spot a rule.

Tea towels	1	2	3	4	5	6	7	8	9	10	Rule:
Pegs	2	3	4	5	6	7	8	9	10	11	Number of pegs = Number of teatowels + 1

Gran had a bag of wooden clothes pegs and she bought a set of 24 plastic pegs and added them to her bag.
 Her bag now has 20% plastic pegs.
 How many wooden pegs does she have?

Key knowledge to use: 20% = 1/5

1/5 of the pegs are plastic so 4/5 of the pegs are wooden.

If 1/5 = 24 then 4/5 = 24 x 4

96 wooden pegs

The supermarket had 256 packets of clothes pegs on their shelf.
 Some were bamboo, some were wooden and the rest were plastic.
 There were twice as many bamboo pegs as wooden ones and 24 more packets of plastic pegs than wooden ones.
 How many of each type of clothes peg were on the supermarket shelf?
 Use algebra to solve a problem.
 Wooden = w bamboo = 2w plastic = w + 24
 $w + 2w + w + 24 = 256$ $4w + 24 = 256$ $4w = 256 - 24$
 $4w = 232$ $w = 58$ 58 wooden 2w 116 bamboo w + 24 82 plastic
 $58 + 116 + 82 = 256$

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This months graduated problems are also on the website along with the Solutions and Notes for this month and for the other 42 sets of graduated problems on a variety of themes.

These problems are a great way of assessing your students confidence and application of mathematical knowledge in unfamiliar problems.

They will also give you an insight into your students abilities to read and comprehend mathematics which continues to be a bigger barrier than lack of mathematical knowledge.



The vet clinic hospital is full. Each animal is safely in its own cage and the cages are kept on the shelves.
 Sort the cages on to the shelves so that each shelf does not exceed its maximum weight limit.

Animal	Weight
Sheep	2250g
Rabbit	3.1kg
Goat	2990g
Deer	0.25kg
Guinea Pig	310g
Parrot	0.95kg
Parrot	840g
Dog	10.8kg
Dog	12.75kg
Cat	6.5kg
Cat	3.45kg
Dog	2.8kg
Pig	3570g
Dog	5.25kg

Maximum weight limit 15kg
 Maximum weight limit 18kg
 Maximum weight limit 24kg

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A Place Value Challenge.....and more.

Teacher Notes & Solutions

Investigating Numbers

Understanding how the number system works is essential to developing number sense and the ability to manipulate larger numbers, estimate and compute everyday life skills.

This task provides students with the opportunity to explore and use the base ten whole number system by:

- understanding the way numbers are written;
- the importance of a group of a ten;
- the importance of regrouping in tens leading to understanding the x10 factor between columns;
- understanding the number system is multiplicative
- use the base 10 system to add and subtract (mentally or by using a written algorithm).



Task One In the packing room:

Provides a context for making groups of ten to develop the connection between the way numbers are written and the number of groups of ten in two and three digit numbers. Connect the putting (not adding) a zero on the end of a number results in multiplying by 10. Effectively all digits move over one column to the left.

Task Two On to the warehouse

Provides a context for investigating the number of hundreds in larger numbers and developing an understanding of the x10 factor between columns.

Task Three Shop Orders:

Provides a context for using the base 10 system to add and subtract numbers two and three digit numbers

Task Four Deliveries

Provides a more complex context for using addition and subtraction.



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Two new phase 2 activities that can be used as assessment tasks.

1. A Place Value Challenge - aimed at lower phase 2 curriculum place value understanding of whole numbers. (This is quite an extended activity with full teaching notes covering using the number system for number operations.)
 (Find in Rich Learning Tasks and Numbers and the Number System)

2. The Vet Clinic - provides a context for working with up to two place decimal numbers converting grams to kilograms and/or kilograms to grams.
 (Find in Rich Learning Tasks, Fractions, Decimals & Percentages and Measurement - Mass)

Maths Assessment Screens

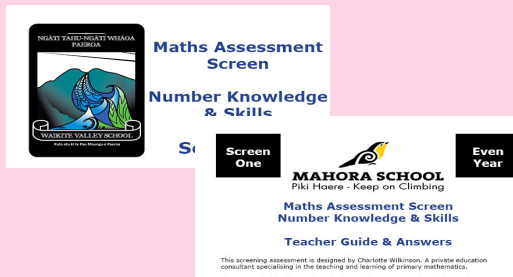
Would you like a proven school wide maths number knowledge and skills assessment to provide the next steps in learning, measures the progress a student has made over the year, works for the benefit of the student and provides data immediately for the classroom teacher with the added bonus of identifying any whole class strengths and weakness in the mathematics programme. Information collected is for teacher, student, school and parents only, so is LOW STAKES

NEW FOR 2027: The Wilkie Way Assessment screens are being offered as a school specific digital option. (A one off purchase)

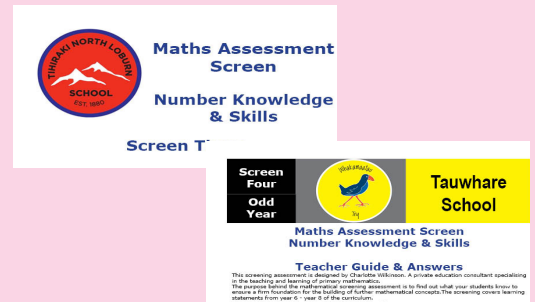
Both odd and even year student scripts and teacher guides are included in the deal as well as the Excel marking files and user guide.

How does it work?

1. Schools request the screens they require using the order form.
2. Schools supply their school logo to replace the Wilkie Way logo and their school name.
3. An invoice for the screens is sent to the school.
4. When payment is received all relevant files will be emailed to the school.
5. School places the master copies of the screens in a safe location. (Making a copy is a good idea)
6. Schools print as many copies of each file as they require when they need them.



View the screens and download an order form at the online store of wilkieWay.co.nz



Reasons to purchase:

- Identifies achievement and gaps in individual student learning;
- Identifies gaps in classroom programme. (If many students have the same gaps at the end of the year);
- Screening at the beginning and end of each year provides student feedback on progress made;
- Aligned to the year group curriculum progressions (but use the screen most suited to the actual student's needs);
- Not timed – use for the benefit of the student
- Easy to administer – does not need to be completed in one session – work to the benefit of the student;
- Marks can be entered into an excel spreadsheet (one file per screen). Gives you individual profiles – showing achieved, gaps and where more practice is required. Gives a class overview (for all students using the same screen)
- A rough guide to the assessment progress descriptors has been made to assist teachers to consider if students are on track with curriculum expectations (available from wilkieWay.co.nz)

What will it cost?

Screen 1 (Years 1 & 2 curriculum) Odd & Even Year versions + Excel file	\$300 + GST
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Screen 1 (Years 1 & 2 curriculum) Odd & Even Year versions + Excel file	\$300 + GST
All four screens, Odd and even versions + 4 excel files	\$1000 + GST

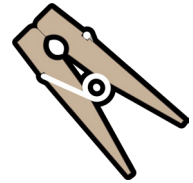
Once you have purchased the screens there is no further cost - copyright prevents you from sharing with other schools.



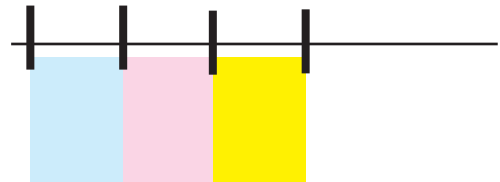
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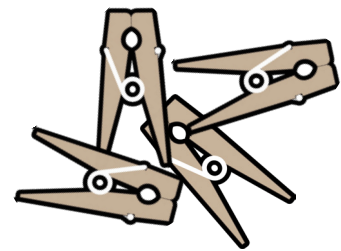


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