The Wilkie Way

Newsletter February 2024

www.wilkieway.co.nz

Developing a Positive Relationship with Maths

I cannot say it any more eloquently than Jo Boaler in her letter to students - if you and your students understand that maths is a conceptual subject and the idea of needing to be fast or a genius are wrong then maybe your students will have the opportunity to develop a positive relationship with maths.

Dear student

I am a professor at Stanford, and I specialize in the best ways to learn math(s). I am from the United Kingdom so I say maths, rather than math – which I like because it captures the different forms of mathematics that exist. I have worked with many students over the years, from kindergarten to college, and have found that they are really helped by the messages that I share below:

Struggling is really important! The most important time for your brain is when you are struggling and finding ideas difficult. Your brain is like a muscle – when you challenge your brain it is like working out in the gym. Some students – often the highest achieving – believe that struggle is a sign of weakness. This is very far from the truth. We know that the most successful people in the world are those who react positively in times of struggle. Celebrate mistakes, they are a time when your brain is struggling and growing!

There is no such thing as a math brain! No one is born with or without a “maths brain” and success in maths is not due to “talent” or “gifts”, it is due to hard work. We all build or strengthen mathematical pathways when we work on maths problems.The best way to build pathways is to work through questions, doing maths! If there is an area of maths you don’t feelgood about, work through some questions and you will develop the pathways you need.

Maths is not just about rules! Maths is not, as many people think, a subject made up of rules and methods. It is a conceptual subject made up of a few big, beautiful ideas and connections between them. If you learn the ideas in your course or grade level, deeply, you will be a mathematician.

Approach maths in different ways! We learn maths when we visualize, draw, build, write, talk about ideas, and move, as well as when we calculate, as maths is a multidimensional subject. If you want your whole brain to develop in the best way, experience maths in different ways.

Slow is good! High maths achievement does not mean thinking quickly as maths is not about speed. Mathematicians are often very slow thinkers as they think slowly and deeply. They know that it is when you dive deeply into mathematical ideas you experience the beauty of maths.

Advocate for yourself! Everyone should work on as high a level of maths as they are ready for – You should always keep high-level maths as your goal, as we can all learn to the highest levels, and maths should be a part of everyone’s future.

Jo Boaler

Progress Steps and Progress Outcomes

The refreshed curriculum provides us with progress outcomes for the end of each phase in a similar way to the curriculum levels provided us with things to be achieved by the end of the level.

If the currriuclum had continued to be used as Level 1 for year 1 & 2, Level two for year 3 & 4, Level 3 for year 5 & 6 and Level 4 for year 7 & 8 we would have had 2 year progress steps. However over the last 25 years there has been significant slippage. The numeracy project as a professional development provided a lot of teachers with greater insight into the teaching of mathematics but the resources, the pink books used as a teaching programme and the GloSS assessment tool created a very narrow mathematical diet which I believe has contributed to the slippage in achievement through lack of challenge and lack of learning experiences.

Reading and understanding the curriculum elaborations for the levels you are working with will provide a much richer base from which to work. These are currently available on the NZMaths website.

While we now have 3 year phases rather than 2 year phases we also have progress steps to assist us to achieve the progress outcomes.
My biggest concern is teachers in year 1 and 2 and years 4 and 5 will only look at the progress steps in the refreshed curriculum without fully realising these are once again a very narrow range of “essential items” . While these may be only the items you assess they certainly should not be the only items you teach.
However history tells us what we assess has the tendancy to drive what we teach.

Do not the let tail wag the dog!

Over the summer I have delved into the refreshed curriculum and considered the progress steps required to meet all the progress outcomes for the end of each phase for each of the sections in the refreshed curriculum.

What I have learnt is that not alot has changed (as I didn’t really expect it had). What is a lot clearer is the expectations of the maths learning experiences students should meet along their maths journey.

We should not have students in year 6 continuing to repeat work from year 3, 4 and 5 because they still haven’t got it (or more likely haven’t got a stage 6 on the GloSS test).

Differentiated teaching means all students meet the same content but some students require much more scaffolding. You are likely to have some students who sit outside the normal range who have an individual education plan.

Differentiated teaching is much easier to achieve with learning support in the classroom which is probably the biggest gap in our education system.
Every classroom should have a teaching assistant and I would urge the teaching unions to push for this rather than increased pay. More money doesn’t give us more time to do the job properly. How much could be achieved if student learning was properly supported?

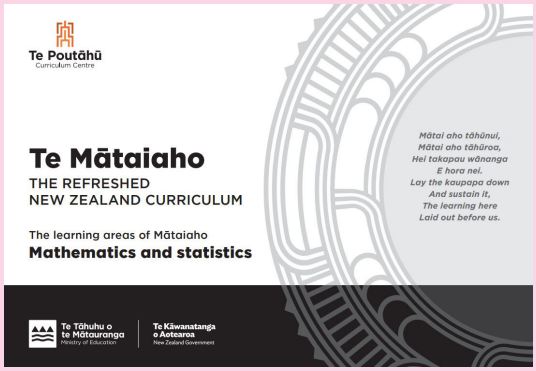
Rewriting the curriculum, while setting out what is required cannot “fix” a significant problem with the education system as it stands. As teachers we can only do our best. For this we need to know what is expected, be provided with appropriate resources, be prepared to learn the content knowledge and concepts we don’t know and cut ourselves a bit of slack when things don’t go as we expected. Real learning happens from mistakes so take a few risks, challenge yourself and your students. You never know you might just have a bit of fun along the way.

There is absolutely no logical reason to be scared or nervous about teaching maths.

Te Mataiaho The Refreshed New Zealand Curriculum

The Learning Area Mathematics and Statistics pdf document on line has been updated. The date in the footer is September 2023 (Previous document was May 2023).
The lay out is in larger print and Do (practices) has its own page at each phase. The know content is pretty much unchanged.
The cover is has also changed with less black so it doesn't use quite so much ink when printed.

One change I have picked up is Year 8 number: Add and subtract fractions with related denominators (instead of same denominators)
To avoid getting lost in the document I have found it helpful to write year 3, year 6 or year 8 at the top of all the pages relating to these end of phase progress outcomes and Do statements.



Numeracy Resources for Wilkie Way Members

Subscriptions purchased at the online store at www.wilkieway.co.nz
Individual $55 - paid via paypal

A school subscription is a cost effective way for all your teachers to have access to a range of classroom resources.
Also professional resources for individual teacher, syndicates and whole school curriculum design, planning, assessment, moderation and content knowledge building

NZ School paid via invoice - complete the form at the online store
Under 30 Students $60 + GST 30 to 100 students $160+GST
101 - 300 students $260 + GST 301- 500 students $360 +GST
501 - 700 Students $460 + GST 701+ Students $560 + GST

February Featured Resource

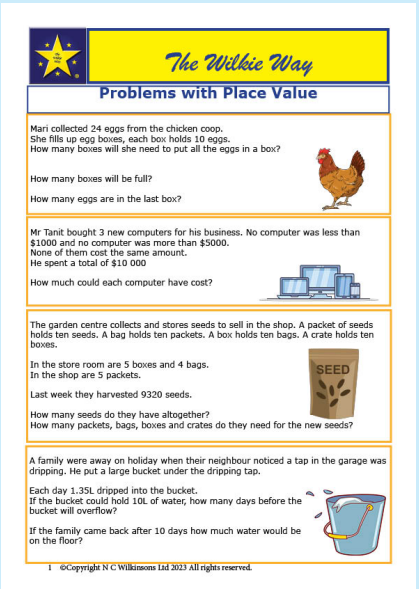
If you like the graduated problems on the last page of this newsletter then you will find 36 more sets of problems in the members area all on different themes.

You will also find the Solutions and Teaching Notes for each set (including this new one)

What else can you get from being a member?
Download the two membership guides from the home page of wilkieway.co.nz ***Professional Resources*** and ***Classroom Resources.***

These are also useful for current members to help you find your way around the site if you have forgotten where something is or to find something else you haven't used before.

Terms and Conditions: Reminder - an indivdual membership does not allow you to share the resources with a third party.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Problems with Place Value

Mari collected 24 eggs from the chicken coop.
She fills up egg boxes, each box holds 10 eggs.
How many boxes will she need to put all the eggs in a box?

How many boxes will be full?

How many eggs are in the last box?

Mr Tanit bought 3 new computers for his business. No computer was less than $1000 and no computer was more than $5000.
None of them cost the same amount.
He spent a total of $10 000

How much could each computer have cost?

The garden centre collects and stores seeds to sell in the shop. A packet of seeds holds ten seeds. A bag holds ten packets. A box holds ten bags. A crate holds ten boxes.

In the store room are 5 boxes and 4 bags.
In the shop are 5 packets.

Last week they harvested 9320 seeds.

How many seeds do they have altogether?
How many packets, bags, boxes and crates do they need for the new seeds?

A family were away on holiday when their neighbour noticed a tap in the garage was dripping. He put a large bucket under the dripping tap.

Each day 1.35L dripped into the bucket.
If the bucket could hold 10L of water, how many days before the bucket will overflow?

If the family came back after 10 days how much water would be on the floor?

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A school membership does not allow you to share resources outside of your school.

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Problems with Vegetables

Dad planted ☐ vegetables in his garden.

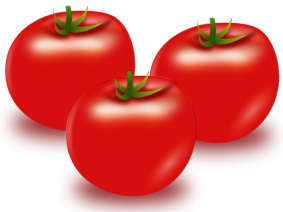
He planted carrots,  peas,  onions  and lettuce. 

How many of each vegetable could he have planted?

Manu picked some tomatoes.

He shared them equally between ☐ families.

How many tomatoes could he have picked?

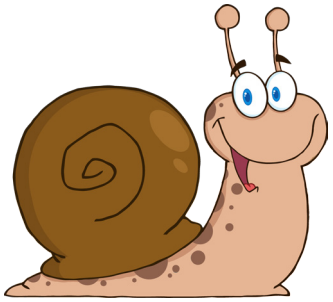


Snails have eaten $\frac{2}{5}$ of my 15 lettuce plants.

How many lettuce plants have I got left?

I have only 20 of my 32 spinach plants left.

What fraction of my spinach plants have the snails eaten?



Sam wants to fence his rectangular vegetable patch. The vegetable patch has an area of $12m^2$

How much fencing will Sam need to go all the way round the edge of his vegetable patch?

I think there is more than one possible answer!