The Wilkie Way
Newsletter April 2021

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All for Maths and Maths for All

Can you create an artistic masterpiece or are you happy to dabble, know about artwork, give it a go without a fear of failure? Can you appreciate art in the environment and the world around you without a negative attitude?

So why is it considered acceptable to have a negative attitude to mathematics?

Our New Zealand culture has allowed mathematics to become something completely separate from everyday life - something that is hard and fearful, that only a special few are allowed into the 'Maths Club" It is a total myth that you are born either mathematically inclined or literacy inclined. This is actually a choice that you are making and perpetuating the myth.

Every human is born with a mathematical brain. Without it you would not survive. Within a few hours of birth, a baby can distinguish between same and different - the most fundamental mathematical concept. Most actions a child makes in their first year of life are grounded in mathematical concepts:

- same/different - visual, auditory, tactile, pattern and rhythm
- judging distances
- exploring objects - for shape, size (length, area, volume), mass, temperature,

Through distinguishing between same and different, auditory, pattern and rhythm they learn the language of words to communicate by being spoken to. Their ability to distinguish between the patterns and rhythms of different languages means they are able to learn multiple languages at the same time. At no other time in a human's life is this ability so strong.

The spoken word becomes a communication tool to enhance the ability for more conscious thought and more deliberate acts of discovery about the world around them. They learn to ask questions and seek information rather than having to find out everything for themselves. "Why?" is a word asked frequently by young children in their quest to learn.

The same/different concepts begin to be quantified as young children begin to use words of one and two to distinguish between these small quantities by subitising. Anything more is just more (one student in my class on entry to school recognised one, two, heaps.)

In a purely playbased environment students are likely to develop sound foundations in the fundamental mathematical concepts through opportunities to explore and experiment. However if these experiences are not verbalised and mathematical language acquired by the students to communicate, describe, explain and reason with these concepts, they will remain unusable foundations for building further knowledge and therefore developing the concepts to deeper understanding.

These foundations are very important and while schools are trying to compensating for development opportunities often missed in our rushed modern world, schools cannot ignore their essential role in teaching the knowledge required for developing the man made created mathematics. The mathematics we use in our daily lives did not just happen - it was invented to be used, it shapes the world in which we live

Counting is the first concept that requires direct teaching, it involves
- the learning of the words,
- the assigning of a word name to a collection of objects and understanding the last word said tells you how many. (Cardinal aspect of number)
- the understanding that the next counting number is the result of adding one more
- the numbers form a sequence where each number has a set position (ordinal aspect of number)
- recognising the number symbols (0 - 9)
- recognising the symbols are repeated in particular positions to represent other numbers

Do not underestimate learning to understand counting:

Achieved Level 1 Patterns and Relationships is when a student has generalised the concept of counting
- Generalised that the next counting number gives the result of adding one object to a set and that counting the number of objects in a set tells how many

Most adults see mathematics as about numbers - while it could be argued to be true, I would define mathematics as about mankind's ability to use numbers to describe and model situations that already exist in the real word (using and applying) or to use the patterns and relations in the known mathematics to predict and create what could exist.
Much mathematics is created and never used, like an art canvas that has been abandoned. Much mathematics is created and then put to one side and picked up by someone else and reworked - like an art canvas that has been painted over.
Whatever mathematics is created, it is mostly built onto an existing body of knowledge - explored and experimented with just as humans do with those fundamental concepts. A new idea can be created from something already known that can revolutionise mathematics. An historical example is the idea that nothing is not nothing. If numbers represent something then what if you had nothing of something? Zero can now be classified as a number - from that idea a complete new number system was created.

I am not creator of mathematics in the same way I am not a creator of artistic masterpieces. However I like designing very nice quilts and I use and apply mathematics to do it.

Most people use and apply mathematics in their everyday lives so why do people perpetuate the myth that mathematics is something separate, that is hard, is not accessible to all, is to be feared and is allowed to generate so many negative emotions.

Listening to a speaker at a conference last week, she probably didn't even realise she was separating mathematics from real life when she could not see how mathematics could be included in a Christian view of education when collaborating in PE was given as an example. I hear public figures say they were no good at maths as if it is something to celebrate.

What do people mean when they say I am no good at maths?
If being good at art means being able to create artistic pieces, then being good at mathematics must mean being able to create new mathematics.

Most people do not create fantastic artistic pieces likewise most people do not create new mathematics.

We need to change the culture about mathematics - change your words

I am good at using and applying mathematics. I have the ability and inclination to use mathematics, at home, at work and in the community. I am numerate.

If you put your mathematics lenses on you will see how much you use and apply mathematics and how much mathematics surrounds you in your world.
Enjoy and appreciate it as if it were a masterpiece.

Hopefully you follow WIlkie Way on FaceBook or Twitter and found the Easter folder of activities under the Special Occassions Heading. New items uploaded are advertised as they are uploaded and membership updates as they happen can be found on the Blog **Maths News & Information** at wilkieway.co.nz

During March Maths Gym was updated (featured below) so each booklet has 8 pages to allow for printing as a booklet.

Maths Aotearoa Level 1b workbooks (workbooks 13 - 25) have been added to the site in anticipation of the new level 1 Maths Aotearoa teacher books and activity cards to be published by Edify VERY SOON. Register your interest with **jane@edify.co.nz**

While these workbooks are written to support Maths Aotearoa thay can be used independently of the scheme of work and should be used to meet the needs of individual students.

Please make sure you **Become a member** BEFORE you create an account or your account will not be activated (Unless your school has a school subscription).

April Featured Resource

The Wilkie Way Maths Gym

Multiplication & Division

Name _____

Class _____

- Coaching Session
- Warm Up
- Workout
- Cool Down

Session One
Understanding Arrays

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The Wilkie Way Maths Gym

This is a series of short workbooks that build up a conceptual understanding to assist students to make sense of multiplication and division and give them the tools to recall or derive multipication facts and associated division facts and develop multiplicative thinking.

Each workbook is designed with:
- A coaching session (teaching)
- A warm up session (guided practice)
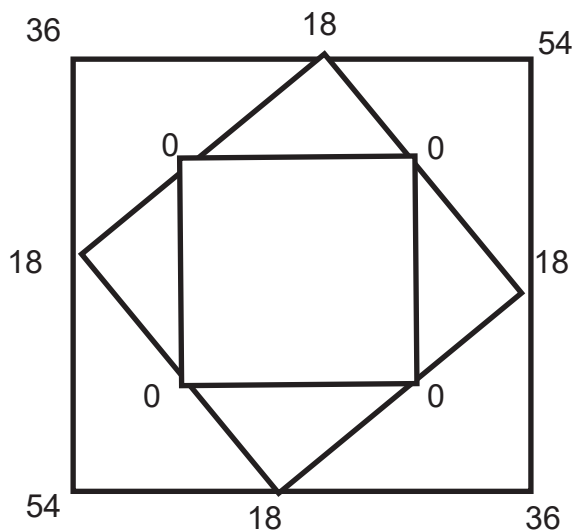- A workout session (independent practice)
- A cool down (consolidation)

1. Understanding Arrays
2. Two times table
3. Ten times table
4. Five Times table
5. Exploring Division
Agility Course 1 (2, 5, 10 times tables)
6. Doubling x4 x8
7. Three times table
8. Nine times table
9. Doubling x6 x12
10. Seven times table
Agility Course 2 (all tables)

Difference Squares

Choose any number to go at each corner of the first square.

The difference between the numbers at the corners give you the numbers for the corners of your second square.

The difference between the numbers at the corners of your second square give you the ummbers for the corners of your third square.

How many squares can you complete before the difference becomes zero at every corner.

Can you predict by choosing "good" starting numbers?

Need some independent maths activities for students to practice basic facts that are not on a screen.

Simple dice and counter games have always worked well as students are involved in vocalising the facts which is very important as basic facts are stored in verbal memory.

All games are laminated card ready to use and just need a 1 - 6 dice and some counters.

Available from the online store at wilkieway.co.nz

Website orders can only accept Paypal payments but a school can request anything from the online store for payment by invoice if they send me an email **charlotte@ncwilkinsons.com** with a list of the items they wish to purchase.

Set 1: Beginning Numbers
Set 2: Counting Sequences
Set 3: Addition 7 Subtraction to 10
Set 4: Skip Counting
Set 5: Beginning Place Value
Set 6: Beginning Fractions
Set 7: Multiplication Practice: 2,3,4,5
Set 8: Division Practice 2,3,4,5
Set 9: Addition & Subtraction to 20
Set 10: Multiplication Practice 6,7,8,9
Set 11: Division Practice 6,7,8,9
Set 12: Fractions
Set 13: Muultiplication Practice
Set 14: Division Practice
Set 15: Fractions Decimals & Percentages

Year groups Bumper Packs are an efficent way of purchasing sets of games.

Each pack has 24 games (2 of each of 3 sets)

See the website for details of sets recommended for each year group