



The Wilkie Way

Newsletter October 2020

www.wilkieway.co.nz

Special Offer: Take out an annual school subscription in term four and renewal not due until February 2022

Complete the attached form or use school sign up form under school subscription on the website.

Using Technology to **enhance** your Maths Programme

Many students especially in year 5 and above have their own device that connects to the internet and in many classes from year 1 onwards one of the group rotations is on a device.

Ask yourself the question: Are you as the teacher making use of these devices to enhance your maths programme or are you delegating part of your maths programme to the device.

Many teachers use programmes like Mathletics or Study Ladder to support their programme by assigning specific sections and specific levels to their students. When used well these programmes provide further practice. They do however require continuous monitoring and can be an ongoing expense. Very few students learn only from these programmes.,

Khan Academy can provide some good explanations but they tend to be completing procedures so students can complete the mathematics tasks set and not necessarily helping the student to develop a conceptual understanding.

Wilkie Way has uploaded some video lessons on position and orientation and will be making more videos to support teachers in delivering specific areas of the mathematics curriculum. These lessons also include follow up activities not on a device.

There are a wide variety of free games claiming to help students learn everything from basic facts to equivalent fractions and more. If they worked then surely our students would not have an issue remembering their basic facts?

Games that require a student to click a choice to gain points and only accepts the correct answer by-passes the brain of most students as they can click randomly (and very quickly) until they hit the correct one. Avoid these types of games - they are pure entertainment and involve only behavioural engagement.

Games that require the student to type the answer - often these are the timed games and the reward is to improve your time on recall of for example multiplication facts. Repeated use of these types of games should assist students to improve their recall. However these games do not teach students how to use anything other than memory of each individual fact. Students need to understand and know about the patterns and relationships between multiplication tables, the distributive property ($x7 = x5 + x2$) or doubling $6 \times 2 = 12$ therefore $6 \times 4 = 24$ to develop multiplicative thinking.

I have concerns with a specific game that was recommended by MOE during the recent lockdown. Having watched students play the game, seen the issues it is causing in the classroom, I dug a little deeper into where the game comes from. It is an overseas gaming company and the free version appears to be a hook for paying for further levels.

I observed students using this game and another student using a timed practice game. Over the same two and a half minutes, the timed practice game asked 15 questions (the student was quite quick at answering)

while on the other game only 3 questions were asked and answered quickly incorrectly. The rest of the time was spent watching animation, with lots of flashing, fast moving and of course the reward points (to the computer in this case) in number size well beyond the experience of the students. I couldn't see the learning. I don't believe we should be using mathematics learning time for students to become addicted to gaming. This is certainly affecting the boys more than the girls.

A site that I do recommend is **mathsbot.com**

It can be used as a question generator for students to create practice questions for themselves if they are practicing specific knowledge and skills. Questions can be generated for early level 2 and upwards. The worksheets can be printed or students can use their device as a textbook.

If you want e-textbooks, Pearson Mathematics and the new version Maths Aotearoa are available as e-books (www.edify.co.nz)

The parts of this website that I have made most use of in the classroom are the manipulatives and the tools. For example, instead of carrying enough cuisenaire rods for a class lesson on fractions every student worked with the cuisenaire rod digital manipulatives to represent the fractional relationships we were exploring.

A down side was I had to teach from the back of the room in order to be able to observe the students screens. (Yes some students still play with the manipulatives - but to be fair it was the first time they had used them.)

Projecting the manipulatives onto the white board would have enabled me to write words and symbols to connect the language - visuals - symbols. You can also cast to a TV.

Using digital manipulatives will enhance the teaching of mathematics just as physical manipulatives do in the earlier years. I would still be using actual manipulatives with younger students as they do need the visual, auditory and kinesthetic learning experiences. With older students I am using manipulatives to represent number properties, so students can see what is happening with the numbers which don't actually exist other than as representations.

Using digital manipulatives also saves schools a considerable amount of money and storage and losing bits is not an issue. Just make sure the devices are charged and the internet is working. The only manipulative that is not useful is the coins; they are UK coins as the site is a UK site.

My favourite manipulatives that I would be using:

- **Counters - double sided**(red one side, yellow the other) - create for pairs to make a specific number as you drag a specific number on to the page then random flip. How many ways can you make
- **Cuisenaire Rods** - for fractions work
- **Dice** - for probability, or for playing a dice and counter game (no throwing the dice around, and no noise)
- **Dienes Blocks** - four digit place value, standard partitioning strategies for addition and subtraction, represent larger multiplication as you can have a large number of blocks,
- **Dominoes** - up to double 9 useful for making snakes of a specific number, matching same or explorative problems that require dominoes.
- **Geoboards** - which can also be changed to isometric for drawing cubes and cuboids.
- **Hundred Squares** - use as a starter to fill in missing numbers, either take a few out or use the random button which puts only a few in.
- **Number frames** - these are the same designed frames as in numicon
- **Place Value Cards** (Arrow cards) up to 7 digits available
- **Rekenrek** - beadframe or slavonic abacus

Scroll down to Tools to find number lines, array grids, place value chart (up to 10 whole number columns, and 10 decimal columns), function machines, multiplication facts, number bonds (addition facts).

Make sure you are using the technology not being used by the technology.

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



Write a Six List This will need 2 - 8 dice and some counters of a different colour each. Roll the dice and multiply the number by 5 to find your place of paper or multiply the number by 1 to find your pencil. When you have a piece of paper and the pencil add the two numbers together and "write" the correct 6 equation on your list by putting a counter on it. If you throw a zero roll all your equations out by taking off all the counters and start again. Who can complete their list first?

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Student Resources Multiplication and Division Level 2 and Level 3

- Four dice and counter games to explore and practice the distributive property of multiplication and derive facts from known facts x 6, x 7, x 8 and x 9
- Multiplication 4 in a row games for all tables from x 2 to x 12

Multiplication Four in a Row Multiply by 8

| | | | | | |
|----|----|----|----|----|----|
| 24 | 96 | 80 | 32 | 40 | 64 |
| 88 | 16 | 40 | 64 | 56 | 48 |
| 48 | 56 | 72 | 8 | 32 | 96 |
| 80 | 40 | 24 | 32 | 88 | 24 |
| 8 | 72 | 48 | 56 | 16 | 64 |

1 2 3 4 5 6 7 8 9 10 11 12

Rules:
You will need one paper clip and some counters for each player. Each player needs a different colour. Place the paper clip under one of the numbers in the row above.
Multiply the number by 8 and place a counter on one of the correct answers in the grid.
Next player moves the paper clip to a new number and multiplies it by 8 and covers the answer on the grid.
Each player is trying to make a line of four counters, horizontally, vertically or diagonally.
First to get four in a row is the winner.



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Graduated problems on a theme:

- Problems with Covid 19
- Problems with Time

Teacher Professional Resources Learning progressions

Power point: Fractions and the Learning progressions

Fractions and The Learning Progressions

Presented by Charlotte Wilkinson

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Numeracy Baseline Assessment

Student name: _____ ID Number: _____
Date of birth: _____ Date of entry to school: _____

| Assessment | Score | Curriculum |
|------------------------|-------|------------|
| Baselines | | |
| After 1 year in school | | |

Part 1 Mathematical Language Development

Language assessments should be carried out in a variety of contextual situations from student play. Discussions should involve students being encouraged to use participating in classroom routine instructions and any other situations where dialogue occurs naturally.

It is not expected that each word is ticked off. Make a generalisation but it might be useful to underline or add any specific words you notice in a problem.

Colour and visual words: include but are not limited to yellow, red, blue, green, black, brown, white, pink, orange, purple, same, different

- Does not understand
- Understands but does not use
- Beginning to use
- Mostly uses
- Uses confidently

Positional words: include but are not limited to before, after, on, in, out, under, over, in front of, in between, in the middle of, next to, behind, forward, back, high, low

- Does not understand
- Understands but does not use
- Beginning to use
- Mostly uses
- Uses confidently

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Assessment

Numeracy Baseline Assessment (also available free via download from the blog - Maths, News & Information)



Solution from last months challenge



Using all of the digits from 0 to 9 just once each, create three 3 digit numbers that are in the ratio of 1:2:3

Here is one solution: 192 384 576

The other three solutions are:

219 438 657

273 546 819

327 654 981





The Wilkie Way

Problems with Houses

There are five houses on our street and 20 people living in them.

If there were the same number of people in each house how many would live in each house?

If a different number of people lived in each house, draw some pictures to show how many people could be in each house.



There are 6 houses on the street.

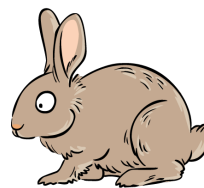
3 houses own dogs, 4 houses own cats. 2 houses own rabbits.

No one owns all three pets.

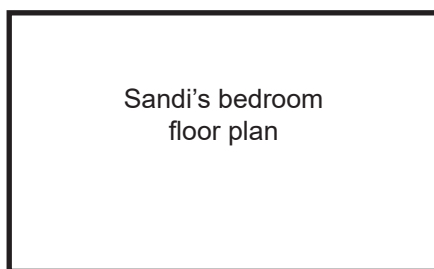
No house has a dog and a cat.

No house has a cat and a rabbit.

How many combinations can you find for where the pets might live?



4m



2m

Sandi is carpeting her bedroom.

If the carpet costs \$37.00 per square metre, how much will her new bedroom carpet cost?

If Sandi waited a week there is a 10% sale on carpets. How much would she save?

Ratu sold a house for \$630 000. He paid back his mortgage to the bank of \$436 000.

The new house he wants to buy cost \$750 000.

He needs a 20% deposit, he can use what is left over from selling his house.

Does he have enough or does he need to have saved some more? If so, how much does he need to have saved?

