



The Wilkie Way

Newsletter June 2021

www.wilkieway.co.nz

Paying attention to all the words for numbers

The goal of teaching and learning math is not to be able to compute or work through algorithms or memorize facts. **It is to understand.** To comprehend the meaning of all the numbers and their connections to each other and then apply that to real life.

In reading, vocabulary is an essential component of comprehension. In mathematics, the task of knowing and determining unknown vocabulary is even more challenging because there are words that are specific to mathematics and not used in everyday conversation.

Math is a foreign language and it is important that we don't take for granted the language used to talk about and describe math problems and situations.

I had the pleasure of observing a lesson focusing on the vocabulary that was used at the start of a unit of work about multiplication and division with year five to seven students. I have permission to share with you.

Some students had recall of multiplication facts, others could derive facts and others were still learning to derive facts. Before starting on planning lessons on developing multiplicative thinking the teacher took the time to explore all the words associated with grouping.

Students worked with a partner and brain stormed all the words they could think of that described a need for a number or a group but wasn't a number word.

After five minutes the students left their paper on their table and moved around to look at other students work before returning to their paper and expanding on what they already had.

(This is an alternative to everyone coming back to the mat and sharing - it serves the same purpose and takes considerably less time)

The teacher then gave each pair of students an activity using a number word in a context and asked them to match the phrase with one of the given numbers.

For example:

A set of hot wheel cars		12
A group of musicians		7
A dozen donuts		10 000
Heaps of money		746
A few customers in the shop		2
Several ducks on the pond		4
A couple of dollars		10

This activity created so much discussion, reasoning, justifying and mathematical argumentation. One student was adamant a few equals 3 and another was adamant a few equals four.

Many students did not know a dozen was 12. Students quickly realised the context could affect the size of the number associated with the word. They argued 10 000 could be the set of hot wheel cars for a serious collector of hot wheel cars.

The next activity turned into an unintentional but incredibly informative assessment activity for the beginning of the unit.

Students were asked what COULD the answer be as they had to chose the numbers for each of the challenges. A couple of the challenges required them to use specific numbers and then they were asked What IS the answer?

1. Multiply a few by a couple
2. Multiply a set by a dozen
3. Multiply a few by heaps
4. Multiply half a dozen by a millennium
5. Multiply some by lots
6. Multiply an even number by a multiple of ten
7. Multiply a group by a slightly bigger group
8. Multiply a dozen by two lots of 8

From this activity it was very easy to see exactly where students were in their thinking about calculating multiplicatively as well as their understanding of the words.

It was clear which students knew their multiplication facts. It showed students reliant on repeated addition. It showed students who could make use of the distributive property of multiplication to derive unknown facts. It showed the strategies students used to work with multi digit multiplication. It showed which students could work with place value and multiples of ten.

The biggest surprise came with challenge number 7 - the word slightly was not interpreted as we expected. The numbers chosen consistently had a very great difference. For example 100×1000 was very common.

Does this signify students see 4 as slightly bigger than 3 so a four digit number is slightly bigger than a three digit number? This is certainly an area for dialogue.

Attached with this newsletter to newsletter subscribers, is a copy of the teacher's activities used with his class which he is happy to share with you.

Meanwhile I also decided to give this approach some thought and considered vocabulary around numbers and grouping

I came up with specific categories:

1. Words meaning a specific number -e.g. pair, dozen, couple
2. Words implying the size of the number - e.g. few, heaps, several
3. Words meaning a group of - e.g. lots, sets, groups, (How often have I been asked which single word should be used - all of them please)
4. Contextual group words - e.g. flock, herd, school (Collective nouns)

Where could this lesson take you?

Think how you could bring maths vocabulary to centre stage in your mathematics units.

Comprehension of the mathematics is totally reliant on understanding the vocabulary used.

New Resources for Wilkie Way Members

Subscriptions purchased at the online store at www.wilkieway.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



Over the next few weeks a new folder will be added to the students resources called financial literacy.

In this folder will be resources for students to learn about the New Zealand currency. The coins and notes in circulation and their relative values.

Activities using money requires students to think in groups of not only one, sometimes addition and subtraction is required and sometimes multiplication and division is more useful.

Word problems include discussion around the vocabulary used when talking about financial problems. Students need to understand the meaning and context of the problems in order to do the maths.

With financial literacy it is important to take the context to the student as these are situations students could find themselves in, in real life.

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



June Featured Resource

Video Lessons Geometric Thinking

These are short video clips for students to watch along with teacher notes and the follow up resources

In this section you will find 5 folders, GT 3 & GT 4 each contain 2 further folders.

GT 1 (Level 1) Ordering Cars

GT 2 (Level 1 - 2) Left & Right Turns

GT 3 (Level 2) Position & Direction 1. Using Grid References 2. Grid References & Compass points

GT 4 (Level 3) Lines, Angles & Shapes 1. Lines, Angles & Triangles 2. Drawing Plane Shapes

GT 5 (Level 4) Bearings

Each Folder contains:

- Video clip
- Teacher notes - learning intentions, key vocabulary, follow up activities, links to other resources
- Resources for follow up activities



The Wilkie Way Teacher Challenge



A challenge to share with your students

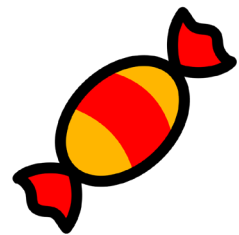
Mr Singh sells small bags of lollies each with the same number of lollies in. He also sells bigger bags with the same number of lollies in each, but more lollies than in the smaller bags.

Sara bought some small bags and some big bags. Altogether she bought 39 lollies.

How many small bags and big bags could she have bought?

How many different solutions can you find?

(There are lots!)



Do you need to build your own **conceptual understanding** of the mathematics you are teaching?

Are you really teaching addition and subtraction and multiplication and division or is your focus on students learning the basic facts or strategies to calculate?

Do you base your learning conversations and dialogue around the properties of addition & subtraction and multiplication and division?

Do the activities you give your students require them to think about and use the properties of addition, subtraction, multiplication or division?

Conceptual ideas begin at a foundation level and should be developing as student knowledge of mathematics increases. They do not start suddenly at a particular curriculum level, nor after students have memorised their basic facts.

Do you know all of these:

- Property of closure
- Property of commutativity
- Property of association
- The distributive property of multiplication over addition
- Inverse relationships
- Additive Identity (0)
- Multiplicative Identity (1)

Find out more by purchasing the handbook from the online store at wilkieWAY.co.nz

