
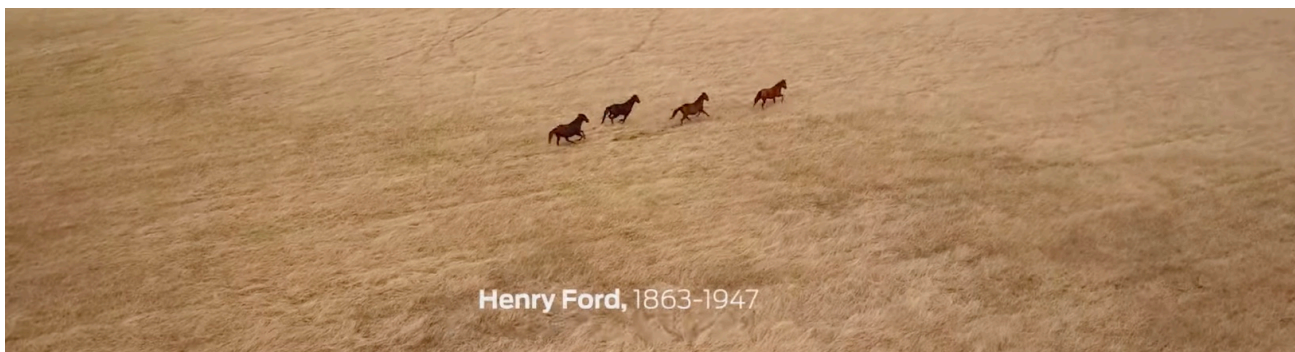


From: Jim Hogan jimhogan2@icloud.com 
Subject: Jim Hogan's Mathematics Newsletter Term 3 2023
Date: 17 July 2023 at 11:21 AM
To: Jim Hogan jimhogan2@icloud.com



As Henry Ford **did not** say “If we keep doing what we always done, we will keep getting what we always got.

If I had asked people what they wanted, they would have said a faster horse”. [Watch the Video](#)

<https://www.kalispellford.com/inspirational-quotes-from-henry-ford/>

He did have a few other quite good quotes.

Jim Hogan's Mathematics and Statistics Newsletter Term 3 2023

A Refreshing Approach

- some thoughts
- some interpretations
- an approach

This will take some reading so get a coffee! Lots in here.

• some thoughts

The new NCEA changes are getting a good old drumming in the press by any opposition politician who can get on TV, in the newspaper or near a public microphone. It is election year so keep your sense of humour and scepticism intact.

To get a few things straight...

- *teachers were given release days in 2021, 22 and 23 to ponder, understand and get ready for the new changes.*
- *the Ministry website with all the “refreshing” news are regularly tweaked as trial results are analysed and new decisions are made..*
- *the old NCEA silo-ed all the strands, and within many strands, silo-ed concepts as well. The new standards connect strands.*
- *the old Numeracy requirement was pretty low and not fit for a C21 high-tech economy. The new NCEA Numeracy benchmark is set at NZC 4.5 which is achievable in my mind.*
- *a few of the many maths standards had become the default mathematics*

curriculum at the expense of student perception of the world mathematics and its reach.

- examinations, or one off assessments, are not the best way to measure and grade understanding so a fresh look is needed. This is my summary of assessment practice.

The NZC and the NCEA system are in need of a jolly good “refreshing”. Literacy and Numeracy, despite huge pushes otherwise, continue to be a major stumbling block for many learners. I think the reasons for this are embedded in poverty and the distraction of modern technology, neither of which any school or teacher has any hope of changing, and both of which can affect anyone. “New” initiatives are not the solution. Data informed approach is needed.

In 2002 I helped facilitate the introduction of “standards based assessment” and in the years that followed helped write standards, write assessments, develop resources, moderate student work, inspect all learning area standards for numeracy evidence, help with the 2007 NZC development and in general keep up with mathematics and statistics news and approaches with my own website and newsletters.

“If you always do what you’ve always done, you’ll always get what you’ve always got.”

If I had asked people what they wanted, they would have said a faster horse”.

[Watch the Video](#)

What perfect timing of the new advert for the Electric Mustang even if it is misquoted and a “faster horse” was added. **We are in need of a refresh, no doubt.** There is also Māori metaphor which is along the lines of “If we keep sailing in this direction we will get exactly where we are headed.” I am fond of this quote because it also means the initial chosen direction is of no great concern because we can always change course. Bit like my first drive on every hole in a round of golf, it actually does not matter where it goes! It is the next shot that matters!

I am suggesting that it is time for mathematics teachers to be doing different teaching, learning and assessment. All in the name of Mathematics Education. So please, put a Math ED Hat on and treat every day as an experiment in teaching and learning. That is actually what is happening anyway, so just accept that and bless the day.

• **some interpretations**



The Default Curriculum

When working with schools I notice teachers still struggling with standard selection for courses, assessment selection for students and quite often choosing a small selection

Here are some extracts that give me that interpretation. *[my comments in square brackets]*.

From the Mathematics Flavoured 1.2 -

<https://ncea.education.govt.nz/mathematics-and-statistics/mathematics-and-statistics/1/2?view=standard>

- The purpose of this Achievement Standard is to enable ākonga [learners] to build mathematical literacy, allowing them to use mathematics to solve or explore applied problems.

[the students are to explore extended problems and/or solve problems that may arise.]

- At the start of the assessment event, assessors need to provide students with the opportunity to participate in a brainstorming and planning session.
- Students will submit their plan for feedback.
- After receiving feedback, students will work independently to complete the activity.

[Here students are being encourage to discuss the context and form problems that may arise. There may be a group plan which is submitted and feedback given, presumably to moderate and align problems to the NZC L6 expectation.]

- Assessor involvement during the assessment event is limited to identifying the broad areas of mathematics required to complete the activity, such as Pythagoras' theorem, volume, and graphs,
- ... and providing feedback on a student's plan for their exploration.
- Assessors should ensure that the mathematical methods identified by the student reflect the level of mathematics found in the Learning Matrix for Mathematics and Statistics.
- Assessors cannot give direct instructions on what to do, such as to use Pythagoras' theorem to find a specific length within an identified problem.

[Only general directions can be provided for the student, again at the right level, with feedback, for a task. Classwork is where specific guidance and instruction can happen.]

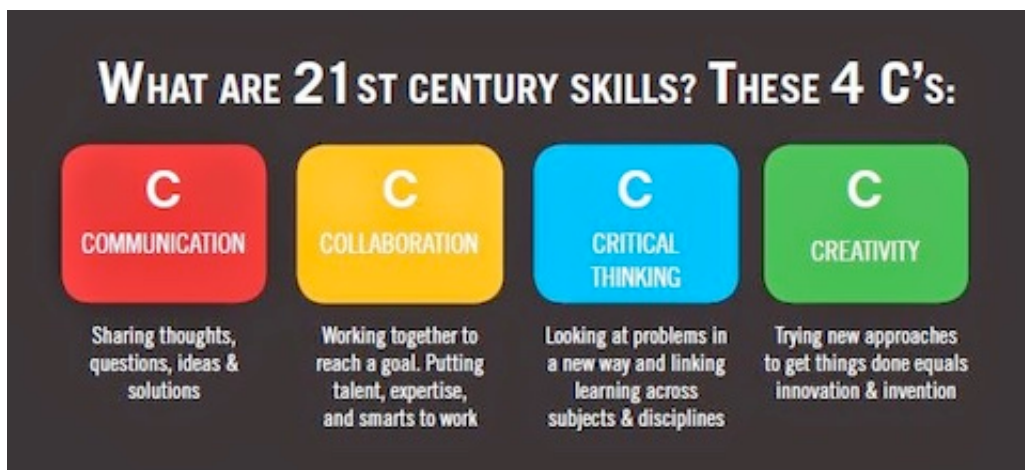
Mathematical literacy means an individual's capacity to:

- identify and understand the role that mathematics plays in the world
- make well-founded judgements using mathematics
- use, and engage with, mathematics in ways that meet the needs of an individual's life as a constructive, concerned, and reflective citizen.

[Students are to take responsibility for their decisions and demonstrate creative and critical thinking. These broadly are the competencies of self management, CCCC and perseverance.]

- Ākonga will use a range of mathematical skills and communicate accurate mathematical information appropriate to the context.
- It is intended that ākonga will have the opportunity to solve or explore a range of problems within a wider contextual setting.

[Communicating solutions might involve orally, written, powerpoint or docs for example, and again it is their choice of problems that may arise.]



From the Probability and Statistics Flavoured 1.1 -

<https://ncea.education.govt.nz/mathematics-and-statistics/mathematics-and-statistics/1/1?view=standard>

- Assessor involvement during the assessment event is limited to providing guidance on a student's plan for their investigation, ensuring that any collected or sourced data allows students to describe sources of variation.
- Assessors will provide guidance to students on the selection of appropriate data sets, including the sample size.
- Assessors can provide a milestone check which offers enough guidance to keep a student on track **but should not compromise the authenticity of student work.**

[Guidance does not mean telling or providing. Guidance means helping to shape the student's or group's thinking with feedback on decisions. A milestone is a chance to discuss and guide, all without telling. Telling destroys authentic assessment. Teachers, especially in remote and isolated places, can be too supportive and allow their "giving nature" to dominate. Anything is available in classwork but conditions apply in assessment. Tough Love Hat please.]

- At the start of the assessment event, assessors need to provide students with an investigative question or purpose statement as part of the planning process.
- Students are able to choose their own investigation with assessor approval.
- Assessors will identify the population for any collected or sourced data.

[At this level I think students should be able to make their own investigative question which can be presented for feedback. I would reword the standard here. Likewise, a student should be able to figure out the population, data source, sample size and method of collection. This is just good statistical procedure and would form part of the constructive feedback.]

- Students may use appropriate technology and resources.

[This is very important, even the of ChatGPT is OK in my mind. At the presentation, if required for authenticity, the assessor(s) questions for the student will reveal understanding and authenticate or otherwise all submitted work. A registered teacher has the authority to assess and this authority is precious so do not abuse this freedom.]

- Students may work in groups to plan and source data but must work individually on all other stages of this Standard.

[The early stages of 1.1 and 1.2 need to involve group work to work out suitable approaches and problems. Group work and overtime is being encouraged. Three heads are better than one. The quality of student work will improve and assessment will be easier. I would expect most students to gain a Merit grade as a result of collaboration.]

- It is intended that ākongā will have the opportunity to explore the context before beginning their independent work.
- This could include brainstorming in groups or across the class, with kaiako (resource person) support, to gain a greater understanding of potential purposes behind an investigation.

[This is a repeat of the previous [comment] so exploring contexts in earlier years is not an issue. Taupo Trout, for example, can be studied in Years 6,7,8,9,10 and again in Year 11 for NCEA. Having visitors to deepen contextual understanding is encouraged and expected. Get a DOC person for the Taupo Trout context.]



Robyn Williams in Dead Poets Society being the guest speaker! What a performer.

Contexts

- Use mathematical methods to explore problems that relate to life in Aotearoa New Zealand or the Pacific

[This is a very clear statement which is expanded a little elsewhere in the standard. Most contexts can be related to NZ.Pacific in mathematics.]

- In this Achievement Standard, different mathematical problems can be set according to ākongā backgrounds, interests, and pathways, in recognition of the breadth of diversity in Aotearoa New Zealand and the Pacific.
- Problems do not need to be set exclusively in Aotearoa New Zealand or the Pacific, but ākongā need to be able to identify how they are related to these regions.

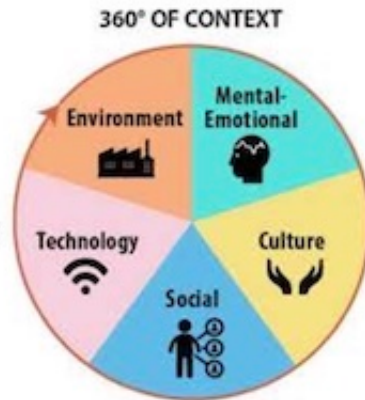
[This provides a little wriggle room for contexts but the intent is very clear so keep contexts related to NZ and meaningful to students. I am reminded here in School Cert days when a SC question asked about supermarkets. The Pacifica students had no idea what a supermarket was and other language used in the paper meant these

questions or tasks were blocked.]

DEFINITION

- What is **CONTEXT**?

Context means the circumstances that form the setting for an event, statement, or idea, and in terms of which it can be fully understood and assessed.



A few ideas for contexts which I am sure you will extend and improve.

- Climate Change
- Transport
- Local Community Project
- Playground Design
- School Grounds Development

- My Sports Team
- My Hobby
- Building
- Car Modification or Restoration
- Motorcycles

- Horse Eventing
- Cross Country
- Fitness
- Weather
- Garden design

- Clothing
- Cooking
- Timetabling
- Funding a Car
- Money Raising

- Taupo Trout
- C@S Database
- Our World in Data website.

• an approach

How might Overtime Assessment Work?

I am assuming regular mathematics instruction has allowed students to explore all strands and by the end of their Year 10 be at or above NZC L4, or Multiplicative. [Something I have been harping on about for years.] My data from most project schools 2002 to 2023 [21 years!] suggests this is a reasonable expectation with Year 10 cohorts being typically between 60% to 90% Multiplicative. The Ministry expectation is NZC L5.

[I am not a fan of introducing NCEA Numeracy Assessment or Standard Assessment at Year 10 because the cohort data should be able to indicate who would pass. Manage workloads. Credit collection is an addiction and should not be encouraged or supported. Only use NCEA Level 1 for those who will use the award.]

The other assumption I am making is that students have been encouraged to become or have become problem solvers with a positive “I CAN” attitude willing to accept a challenge presented in the Mathematics and Statistics Learning Area. They do not have to be experts, just open to learning, risk taking, persevering and making mistakes.

Terms 1 and 2 are the time for assessment of the two **INTERNAL** achievement standards. **Only one Year 11 M&S Course** should be offered to all students. What happens in Term 3 and 4 and for Numeracy will depend on the Term 1 & 2 successes.

The Year 11 course is best viewed as two semesters. Gaining M&S 1.1 and 1.2 and Numeracy allows for externals and extension. Not gaining one or both or all three creates the target that should be the focus.

[The externals are of no importance to a student who can not provide and present sufficient mathematical evidence to self selected contexts and problems. This is the clear beauty of these new standards and this statement is probably the best summary of this complete newsletter!]

A Statement for the School Course Selection Manifesto

Course Name - NCEA Year 11 Mathematics and Statistics

Course Description - Mathematics and Statistics knowledge and skills are an essential component of every future pathway. The more mathematics you know the more mathematics you will use. The junior years provide the background needed for assessment and further learning in Year 11. There are two internal and two external assessments. Terms 1 and 2 form the first semester and in this half of the year it is intended for students to complete a **mathematics portfolio** and a **statistics portfolio** which are used to assess the internal standards and secure 2x5 credits towards the Award of NCEA Level 1. The **portfolios are a series of tasks** with feedback and guidance developed around a context chosen by the student. Class time will be shared between learning new skills and concepts and developing the portfolios. Successful completion of portfolios in Semester 1 opens the pathway for external assessment preparation in mathematics and/or statistics and a further 2x5 credits in Semester 2, Terms 3 and 4. It is also expected that students will be gain the Numeracy requirement for NCEA Level 1. Semester 2 otherwise becomes another opportunity for portfolio and numeracy assessment. [Note Numeracy can be gained in any school year and must be gained before any NCEA Award is granted.]

Course Content

Semester One

Term 1 - Overview

Portfolio development will require a structured approach and in the early stages is a collaborative event. The stages of portfolio production are bulleted below and teacher input is expected to aid student choice and work.

- Group selection and selection of Context
 - Development of Tasks
 - Development of the Plan
 - Plan Submission and Feedback

- Portfolio Development
 - Portfolio Feedback, ongoing.
 - Portfolio Presentation
 - Portfolio Assessment

Individual Lessons would be focused on needs and concepts. A lesson would have a **starter** which probes or revises; a **need** explained and practiced; a **new idea** explained and practiced; and **time for portfolio work**. As the term progresses more time is allocated for portfolio development and for some the introduction of work towards other standards could be developed.

Mathematics and Statistics instruction to NZC Level 6 across the strands Number, Algebra, Geometry, Measurement, Probability and Statistics would inform the learning all with awareness of student need.

Term 2 - Overview

As above but more focussed on the other standard. Teachers will choose however I suggest AS 1.2 in Term 1 and AS 1.1 in Term 2. There is no reason why both portfolios can not be done simultaneously depending on students and teacher knowledge and organisational ability.

Semester Two

Depending on Semester 1 success Semester 2 or Term 3 and 4 then become further opportunity to complete, or a new coursework or an agreed combo.

[I do not think that NZC L5/6 students who are clearly well organised interested and studious need the NCEA L1 Award at all. They do need to tick off Numeracy at some stage but the teacher workload of portfolio and organisation could be reduced somewhat by having the top performing students focus on algebra extension, coordinate geometry, graphing and trigonometry extension work. There is no ceiling in mathematical development. This could be a chance to teach mechanics, mathematical physics, experimentation and more advanced statistics. School policy could well missile this stance.]

General Comments

So there you have Jim Hogan's interpretation of the new NCEA Level 1 M&S Standards and some ideas for how to present and assess them. This really is a refreshing opportunity to get a new broom out and make some sweeping changes to mathematics programmes. Kia Kaha - Be brave. Create a new future.

Modern 21st Century students have grown up in a very different tech savvy world from the later 20th Century familiar to most teachers. They often display different characteristics in terms of concentration span, worldliness, experience and opportunity that teachers experienced. Strangely, despite the poverty often cited in news today, there is a lot of money and wealth available and is manifested in new cellphones, purchased food, cars and transport, clothes and entertainment. The distribution of wealth is more spread than ever however. All is not equal.

Teachers have to know their students well and adapt learning to suit.

Today is an Applied Mathematics world. There remains a small but vitally important Pure Mathematics thread but pretty much 99% of all mathematics today is using and hence applied. That should be a core understanding shared by all teachers in all learning areas and communicated to students as such. Solve and explain. Reason

and justify. Be creative with solutions and critical of performance. Persevere and enjoy the mistakes. All problems are solvable. Two heads are better than one!

I am very happy to discuss or develop further any of the content of this newsletter. Email me at jimhogan2@icloud.com,

PLD UPDATE

If you do not ask you will not get. Henry Ford should have asked people what they wanted and I think he would have been impressed and informed by the answers. Please ask if you have identified issues in your school situation concerning mathematics teaching and learning at all levels.

It has not been determined by the Ministry of application dates for Term 3 and 4 2023 as of time of me writing this news. It would be a really wise idea to have your Principal contact the School Advisor (from the Ministry, all schools have one) and request that PLD opportunities like the current system has allowed be continued and fully funded in a Regional way. Schools know best what they need and have enjoyed that freedom for some time now. The alternative is a Ministry run National approach which we all have experienced.

Check my website for any news and for a huge resource of problems and readings. See my email signature.

Just for Fun

• Math Movies

<https://people.math.harvard.edu/~knill/mathmovies/>

Showing these clips can generate amazing mathematical discussion.

• Earth Problem - Matter is mostly Space

I read that if all the **space or gap** between the nucleus and electrons of all the atoms that make up the Earth, all 6×10^{24} kg of it, the volume remaining would fit inside a thimble or cube about 1cm across. True or false?

• Space and Beyond Problem

What would you weigh on the Moon? What would your mass be?

• Temporal Problem - About time!

How old are you in seconds? Estimate how many heartbeats your heart has successfully completed so far.

• World Cup Rugby 2023 - Soon! FR - v- NZ SEPT 8th 2023

















Make your score predictions and work out who will make the Semi Finals. The website has rankings. <https://www.rugbyworldcup.com/2023>

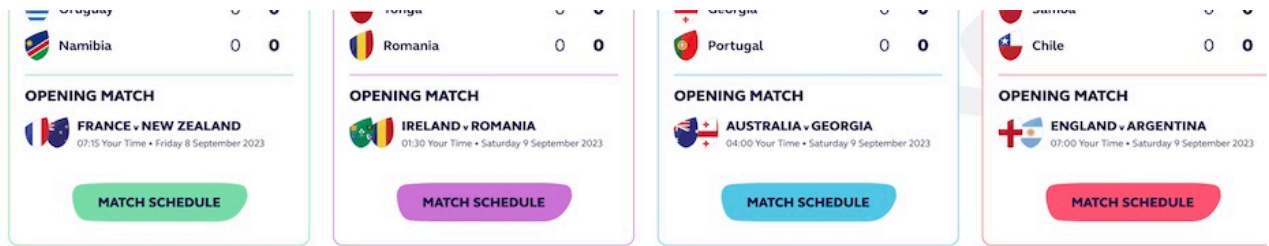
WRC Task - Class Project

Collect all score predictions for your maths class before the games start.

Record all scores and figure out a way to find who made the best predictions in each Pool.

You could bet a biscuit and winners take all.

POOL A	FULL TABLE →	POOL B	FULL TABLE →	POOL C	FULL TABLE →	POOL D	FULL TABLE →
 New Zealand	PL PTS 0 0	 South Africa	PL PTS 0 0	 Wales	PL PTS 0 0	 England	PL PTS 0 0
 France	0 0	 Ireland	0 0	 Australia	0 0	 Japan	0 0
 Italy	0 0	 Scotland	0 0	 Fiji	0 0	 Argentina	0 0
 France	0 0	 France	0 0	 France	0 0	 France	0 0



Enjoy the lengthening days, summer is coming, enjoy the rugby and play golf. See your local club about free golf for juniors. Go fishing.

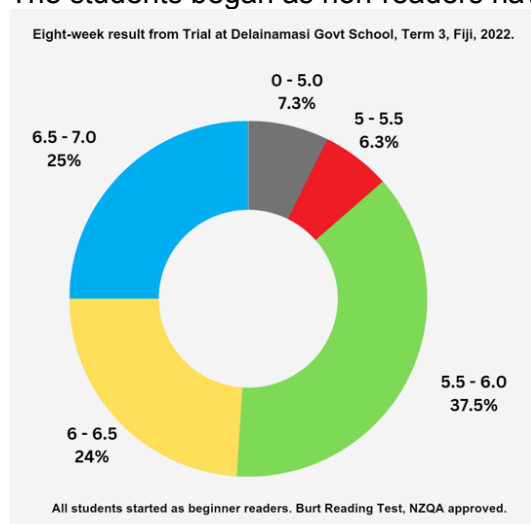
Something Different Now!

PWordsmart/Prolexia - Here is some literacy/dyslexia help for students who are struggling with reading. Take a read. There is a free app to try out as well. The guy who developed this is an RTLB teacher and has data to support its success.

"Wordsmart/Prolexia: Empowering Educators/Parents to Revolutionise Students Literacy Skills Nationwide."

For three years, the Wordsmart learn-to-read app has pioneered an innovative approach using oral storytelling to teach the letter sounds. This approach was sponsored by a Fijian Government pilot where the oral stories from the WordSmart App were spoken in Fijian. We included card games, sight word cards, decodable Sunshine books, accompanied by a teacher's manual.

The results were remarkable, with over 90% of students reaching a reading age at or above their chronological age within eight weeks as measured on the Burt test of Word recognition. The students began as non-readers having just started to learn the phonemes.



Encouraged by this success, we have now developed the Prolexia app, aiming to empower all dyslexic students to excel.

Dyslexia affects up to 20% of the population so changing the paradigm from dyslexia meaning difficulty with words to Prolexia meaning proficiency with words will have a profound impact.

Prolexia's U.S.P. (unique selling proposition) involves changing a student's mindset and

Prolexia's C.E.R.T. (unique learning proposition), involves changing a student's mindset and discovering their passions to provide books above their reading age, based on their interests. We believe this approach is crucial because it plays to the strengths of dyslexic students enabling them to become intrinsically motivated.

Furthermore, Prolexia aims to alleviate the challenges faced by parents, teachers, and educational professionals. In collaboration with educational psychologists, the Prolexia app provides a personalised remediation programme using open-source assessment tools to identify the knowledge gaps and skills that need improvement.

Our programme goes beyond reading fluency by fostering advanced literacy skills to elevate the student's comprehension levels thus enabling them to derive inferences and formulate hypotheses.

Prolexia aims to combine educational psychologists' dyslexia assessments with targeted intervention strategies. The ultimate goal is to implement this solution throughout New Zealand's education sector and eventually make it available worldwide.

We invite all educators, teachers and parents to join us to revitalise New Zealand's neuro-diverse literacy landscape.

Click here wordsmart.app/offer1 to claim your FREE taster of Wordsmart's groundbreaking app and gain exclusive early access to the Prolexia app.

This is not the first time I have written about literacy help in my newsletter but it is the first time there is also an .app to download and use.

Caio
JIM

Jim Hogan
Accredited Facilitator ACC 572
[Jim's Website](http://schools.reap.org.nz/advisor/) <http://schools.reap.org.nz/advisor/>
[Teaching Maths Book](#)
[Problem Based Learning Resources](#)
Taupo NZ
Mobile : 027 461 0702
Email: jimhogan2@icloud.com

Mathematics is Thinking and Thinking is Mathematics

