Mathematics

Why do we study Mathematics? As mathematicians we ask questions such as; Why are geodesic domes structurally so strong? We look for answers to our questions. We learn how to solve problems by acquiring the knowledge and means by way of gaining skills, methods, techniques, and strategies. We find ways to communicate our thoughts. We learn to develop a logical thinking process. We learn to dissect and analyse problems.

In practical terms it helps us with everyday challenges such as:

- the statistics we are bombarded with
- understanding and managing time
- prioritising
- managing our finances

It leads to a deeper understanding of life's complexities and our ability to come to terms with them.

Mathematics is relevant to nursing, real estate selling, automotive engineering, engineering, electrical employment, computing, and many other fields of employment, as well as being relevant to many tertiary studies.

The Refreshed Mathematics Curriculum has five big ideas. They are:

Whiria te kaha tūātinitini, whiria te kaha tūāmanomano.

Together we can use our strengths to achieve more. All learning contributes specific threads that we can use to weave a rope strong enough to get us where we want to go, do what we want to do, and be what we want to be.

The world is full of patterns and structures that we use mathematics and statistics to understand. Mathematics and statistics enable us to notice, explore, and describe similarities, regularities and irregularities, and trends in the natural, mathematical, technological, and social worlds. They provide tools and ways of working that can reveal patterns and structures useful for decision making, understanding and predicting phenomena, and creating new insights.

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Kei hopu tōu ringa ki te aka tāepa, engari kia mau ki te aka matua.

Do not catch hold of the loose vine but lay hold of the main vine. You can use the strength of the aka matua (main vine) for the sure footing you will need to reach for new ideas and to climb to new heights.

The world is characterised by change and variation that we use mathematics and statistics to understand.

The world embodies a multitude of temporary and permanent relationships in which change and variation occur. Some relationships are linear; others are exponential. Mathematics and statistics enable us to systematically describe and analyse different types of change and variation, and to generate insights and make predictions about them.

Ko te pae tawhiti whāia kia tata, ko te pae tata whakamaua kia tina.

Seek to bring distant horizons closer and cherish those that you have attained. There will always be pae tawhiti, the 'not yet', but we can move ever closer to that for which we strive.

Mathematical and statistical logic and reasoning enable us to identify and explain relationships and to justify conclusions.

Reasoning from observation (induction) and reasoning from theory (deduction) allow us to explore situations using mathematics and statistics. Mathematical and statistical logic and reasoning differentiate what is probable from what is possible and allow us to draw reliable conclusions about what is reasonable or not.

Kotahi te kōhao o te ngira e kuhuna ai te miro mā, te miro pango, te miro whero. (Pōtatau Te Wherowhero)

There is but a single eye of the needle through which white, black, and red threads must pass together, yet each thread keeps its own colour and integrity while adding its strength and beauty to the others.

The interface between mātauranga Māori and mātauranga mathematics and statistics offers opportunities for insights that uphold the integrity of each knowledge system.

Mātauranga Māori and mathematics and statistics are different systems for viewing, understanding, and organising the world and for guiding how we operate within it. Mātauranga Māori makes meaningful and distinctive contributions to mathematical inquiry and knowledge in Aotearoa New Zealand, just as mathematical and statistical insights contribute to mātauranga Māori. When considering concepts, processes, and artifacts from te ao Māori, we maintain their integrity by exploring the mātauranga Māori associated with them before formulating mathematical and statistical hypotheses about them.

Nō ngā tūpuna, tuku iho, tuku iho.

The human ideas that have been passed down from generation to generation can help us develop our thinking today.

Mathematics and statistics have a continuous, evolving human history.

Mathematics and statistics have been constructed over thousands of years across the globe as we have grappled with notions of quantity, numerical representation, measurement, dimension, and pattern. They continue to be constructed from ideas drawn from many cultures. In Aotearoa New Zealand, our location in Te Moana-nui-a-Kiwa – with its multiple cultures, artifacts, and knowledges – contributes to mathematics and statistics.