

# CULTURALLY RESPONSIVE MATHS

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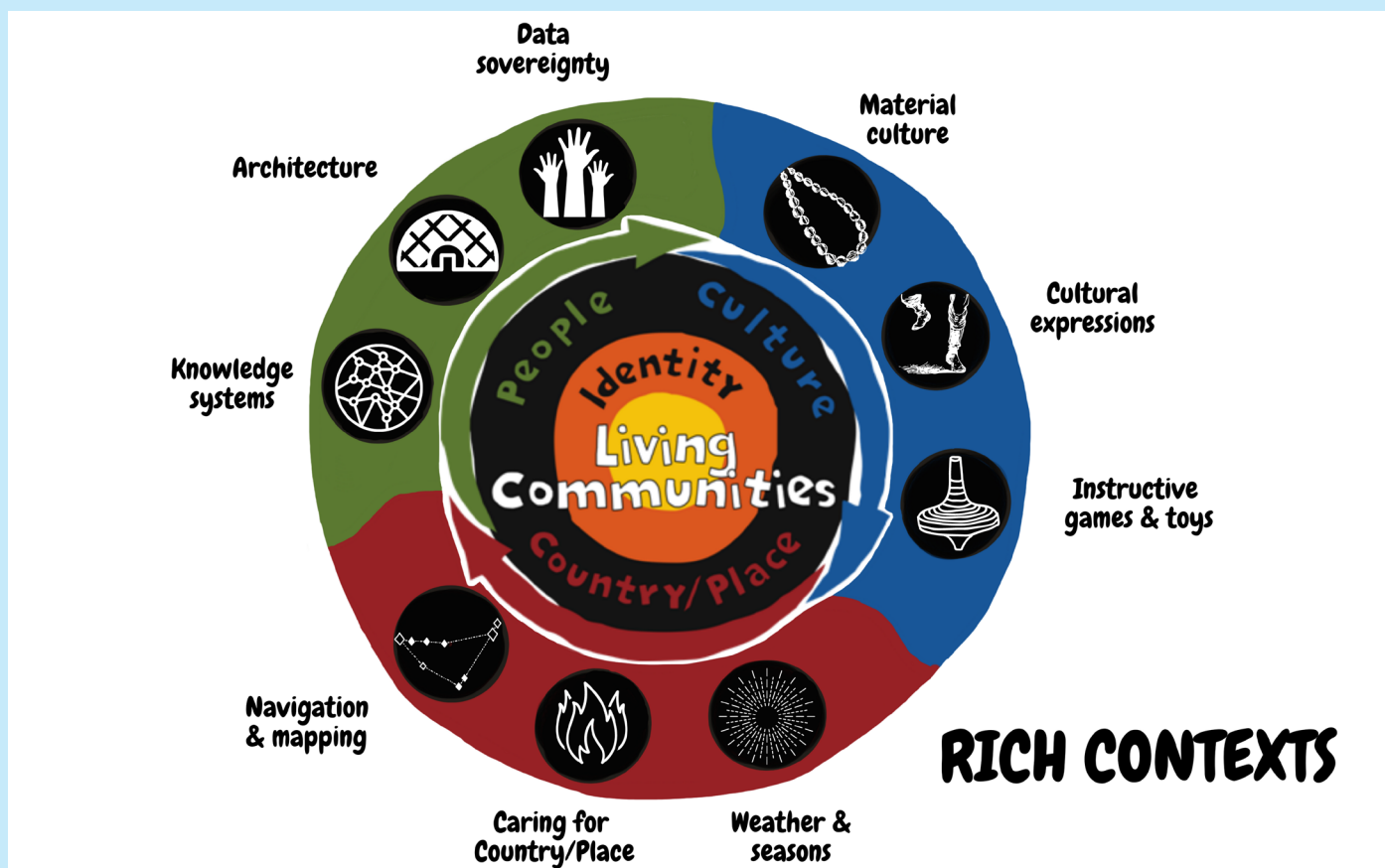


Figure 1.

## CULTURALLY RESPONSIVE MATHEMATICS EDUCATION: TEACHING MATHS THROUGH ABORIGINAL AND TORRES STRAIT ISLANDER HISTORIES AND CULTURES

In my recent role as ACARA's Curriculum Specialist, Aboriginal and Torres Strait Islander Education, I had the great privilege of working with Professor Chris Matthews from the Aboriginal and Torres Strait Islander Mathematics Alliance (ATSIMA).

Together, we developed over 100 content elaborations in the Aboriginal and Torres Strait Islander Histories and Cultures cross-curriculum priority (CCP) for the latest version of the Australian Curriculum: Mathematics. This endeavour involved a lot of research, discussion and deliberating about locating appropriately and respectfully First Nations' content in the maths curriculum. We wanted to honour ways of being, knowing, thinking, and doing in culturally responsive ways, knowing that we were tasked with locating all of this within a Western framework.

Whilst we lost some content elaborations because of the parameters in Western understandings of mathematics, we were able to weave some narratives through the F-10 years levels and through the six strands of the Australian Curriculum: Mathematics.

These narratives are based on the nine rich contexts that we connected the elaborations back to through the three key concepts of the CCP:

- Country/Place
- Culture and
- People

This can be seen in Figure 1. The nine rich contexts are inextricably connected, for example, knowledge systems exists in all nine contexts. The 91 elaborations that made the final publication of version 9 of Australian Curriculum: Mathematics are only the tip of the iceberg in what is possible; we know that there are so many more maths situations, maths stories and maths contexts that could (and should) be included.

Since leaving ACARA, I have been working with ATSIMA on several projects including the development and delivery of professional learning programs for schools and education systems, and the development of culturally responsive mathematics resources for the classroom.

We incorporated Professor Matthews' Goompi Model into these programs and resources and embedded the new content elaborations we developed. The Goompi Model was created on Quandamooka Country in Queensland and describes a process of teaching as outlined in Figure 2.

The results from this approach to teaching and learning so far reveal a significant increase in student and teacher engagement by connecting culture with mathematics.

Critically, a collaboration between First Nations educators and teachers and the localisation of cultural content are features of the Goompi Model. I have seen some amazing things in our schools, such as the teaching of place value through local contexts and cultural content that have

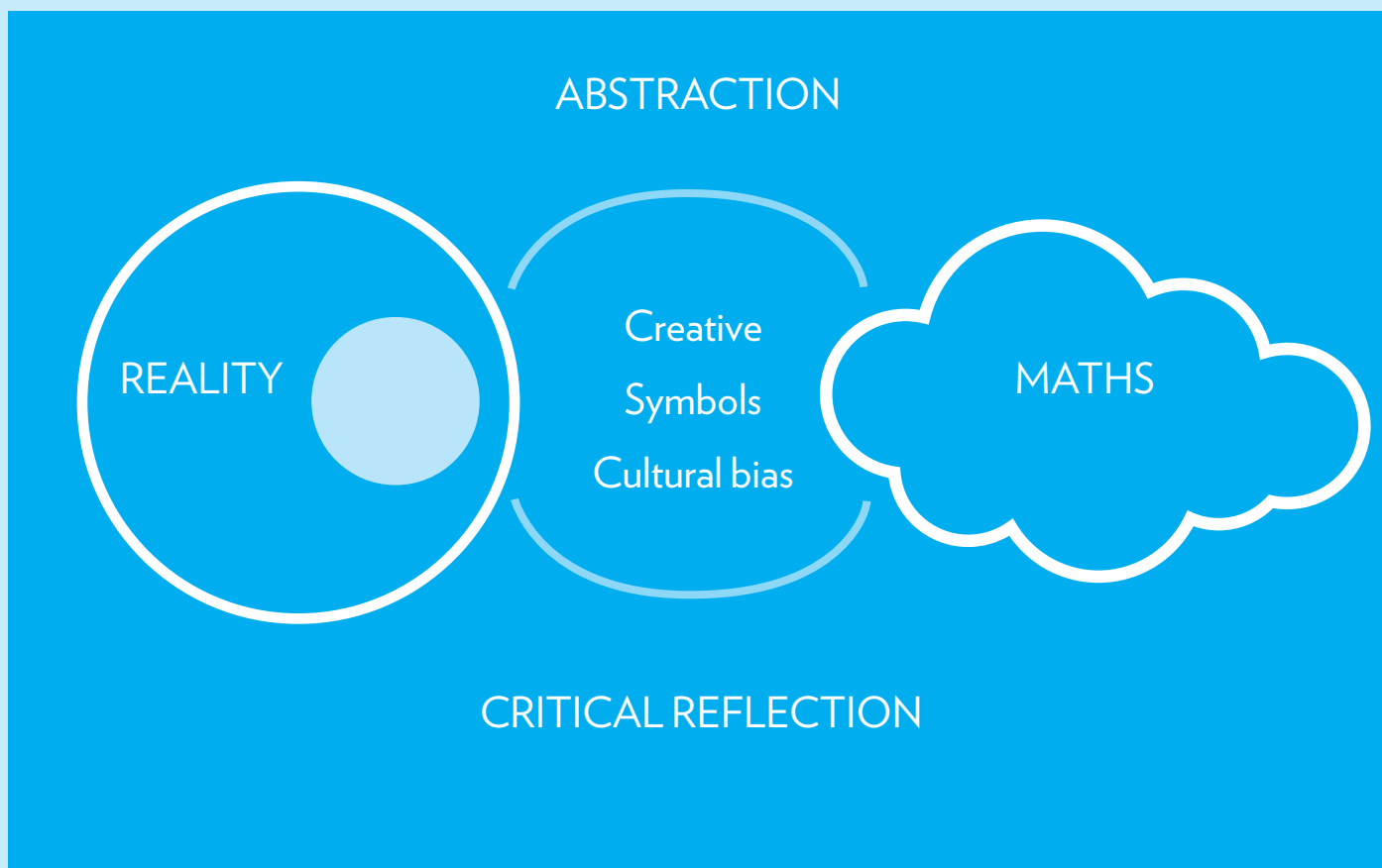


Figure 2.

allowed teachers to teach maths creatively by starting with students' realities, the importance placed on students' own symbolic expressions of mathematics and connecting this with the mathematics required in the curriculum.

During 2022, I had the privilege of working with two schools in Melbourne to develop classroom resources. An example of this work comes from Jess and Shane from Heathmont College who produced a Year 7 statistics unit of learning that focused on the Wurundjeri Season. The learning intentions include:

- to understand the seasons used by the First Nations Peoples of the Kulin Nation;
- to understand that change of season is based on environmental changes, not time of the month; and
- to be able to statistically analyse birth months and Kulin Nation seasons.

Curriculum content covered includes the Organising Idea A\_TSICP1 from

the Aboriginal and Torres Strait Islander Histories and Cultures cross-curriculum priority: First Nations communities of Australia maintain a deep connection to, and responsibility for, Country/Place and have holistic values and belief systems that are connected to the land, sea, sky and waterways. Content from the mathematics curriculum includes calculating mean, median, mode and range for sets of data, and interpreting these statistics in the context of data.

Nicholle and Ross from Brookside College developed units of learning for Years 1 and 3 that include teaching fractions through a range of contexts including First Nations use of local native plants, and quill necklaces. Students explore these cultural contexts and learn different mathematical concepts through them.

ATSIMA's focus continues to remain on developing and delivering customised professional learning programs with, and for, schools and education systems and integrating culturally responsive maths resources into these programs.

We are in the process of designing a 36-hour course for educators plus a 12 hour train-the-trainer course.

Our unique conferences are held biennially with the next one on Yolngu Country at Yirrkala in Northeast Arnhem Land from 9-11 October 2023. To access our resources, join ATSIMA, [www.atsima.com](http://www.atsima.com).

To learn more about Indigenous education in mathematics, register to attend Dr Chris Matthews' keynote at the 2023 MAV conference. To register, visit [www.mav.vic.edu.au/Conference/Annual-Conference](http://www.mav.vic.edu.au/Conference/Annual-Conference).