

## Maths challenges day

Cluster Story

**Lisa Gray**

Cluster Coordinator

Tannum Sands State School

Gladstone Cluster

The Gladstone Cluster in regional Queensland consists of two primary and three high schools. Throughout the project the cluster has liaised with the local Indigenous community. In mid-2011, a meeting was held with representatives from the leadership and teaching staff of the schools, leaders and parents from the Indigenous community, and representatives from the education system. This meeting was held at a non-school site. During a part of the meeting the Indigenous community members met alone to discuss and come to some consensus on what they would like the schools, through their teachers, to do to help their children improve their mathematical outcomes. The main request the Indigenous parents and leaders had was that the teachers should get to know their children better, particularly outside of the formal classroom setting. In short, they wanted the teachers to have a stronger relationship with the Aboriginal and Torres Strait Island students.

The Maths Challenges Days reported on here was a collaborative response after listening to members of the local Aboriginal community. It was built around teachers and students relating to each other in meaningful ways as they engaged in shared mathematical experiences. The first event was held in 2011 and another in 2012. This will now be an annual event for the schools in the Gladstone region.

### Maths Challenges Day 2011

The first Maths Challenges Day was held in October on the fore-shore at Tannum Sands and all the Indigenous students in Years 5 – 9 from the participating schools were invited. The day began with all students getting to know each other and then we split into smaller groups and began rotating mathematics activities. The students worked through a variety of challenges and ended with the team-building challenge of building a geodesic dome.

The day culminated with the yarning circle and this allowed students to share their feelings and experiences of the day. With the primary students, it was predominantly positive.

Overall the day was very successful and it provided a valuable opportunity for teachers to work and converse with their students in a different environment. In general, the students were confident and willing to participate in the mathematical challenges, although the hands-on activities proved to be much more of a success than the pencil and paper tasks. The tasks that had multiple pathways for finding solutions were particularly successful, as were activities that promoted deep rich mathematical discussion. Both primary and secondary students cooperated well in their groups, and many of the students displayed leadership qualities, although the structure of the day wasn't conducive to interaction between students from other schools. The only disappointing aspect of the day was the non-involvement of Aboriginal and Torres Strait Islander community members.

### Maths Challenges Day 2012

After the first Maths Challenges Day, we developed the second event with no paper and pencil activities. The groups were made up of students of different ages and from different schools, and all activities were outside.

**“The main request the Indigenous parents and leaders had was that the teachers should get to know their children better, particularly outside of the formal classroom setting.”**

This time the day was held at the Tondoon Botanical Gardens and it included the following “Challenges”

- The Game of Nim: Students had to work in pairs and collect 20 items each from the ground only. The students took turns at picking up one, two or three items and the winner was the player who left only one item.
- Measurement (mass) using real-life objects: Students were challenged to measure 1 kg and then design and build a bag made out of newspaper that would carry 1 kg.
- Measurement (length): Students were given a problem to solve using tape measures, tent pegs and rope.
- Number cards: Each student had to randomly scatter number cards for their partner, who then had to run and collect the number cards in order whilst trying to beat their partner’s time!

Unfortunately, we still did not have any community/parental involvement, but the students and teachers were very engaged and enjoyed working and relating to one-another in this out-of-school setting. The students found the problem-solving activities very intriguing and the attitudes of the older students changed into more of a mentor rather than being ‘too cool’. The high school students proved to be fantastic role models for the younger students. All students felt comfortable to ‘have a go’ once they were familiar with their group members. One secondary student commented about working with primary students, “I really like showing them how to do things and helping them to understand what we’re learning.” They reinforced maths strategies in a non-traditional way. In working on the tasks, the students were very supportive of each other, especially in mixed groups, and the relatively unstructured nature of the day meant the students didn’t feel restricted within time constraints.

### The Impact of the Maths Challenges Days

While it is relatively easy to see the positive aspects of the Indigenous students’ involvement in the mathematical challenges on the day, there have also been some enduring gains for many of the students. For example, some Indigenous students’ attendance has increased which could be related to their improved relationship with their teacher. Parents have commented that their child is more enthused about mathematics and have even been creating more work for themselves at home, to practice what they’ve learned at school. On the most part, the teachers who participated in the day have been able to maintain positive relationships with the Indigenous students who attended the day.

One teacher’s relationship with a yr 7 Indigenous student is built on a mutual trust and understanding. The student feels safe at school and enjoys being encouraged and challenged to do her best. This allowed her to experience success whilst at primary school. Unfortunately this student hasn’t developed a similar relationship with a teacher at high school, thus her schooling has ended.



#### **Finding 1.4: Relationships**

*Know that fostering relationships grounded in genuine care and respect are essential to engagement.*



#### **Finding 3.8: Pathways**

*Include multiple pathways and approaches to learning that allow students to investigate a range of mathematical concepts and methods and strategies.*



#### **Finding 3.11: Represent**

*Encourage learners to represent their learning and thinking in a range of formats (e.g. verbally, physically, symbolically and with technology and not just pencil and paper).*



#### **Finding 7.4: Opportunities**

*Provide the community with opportunities to have voice and ownership and make decisions about curriculum to ensure that learning experiences have family and community significance.*