What is YuMi Deadly Maths Program?

- Originally designed for Aboriginal and Torres Strait Islander students, but has been adapted to benefit low SES students including migrant and refugee students, and those at risk of disengaging from learning.

- In 2009, YuMi Deadly Centre refined the initial program with a focus on indirectly influencing students’ achievement in mathematics through teacher training.
YDM and Australian Curriculum

Are they compatible?

• Australian Curriculum focus is content (what and when)

• YDM focus is pedagogy (how to teach)

• Australian Curriculum should “be adapted for school and class context”

• YDM focus is on linking mathematics to students’ reality and real world applications of mathematics
Are our Deaf and Hard of Hearing students visual learners?

- We believe the YuMi Deadly Program supports to facilitate the Deaf students understanding better of their mathematical world, since they are visual learners.

- The Deaf and Hard of hearing students may not only just visual learners but are also tactile learners and kinaesthetic learners.

- A visual learner: Learns best by seeing.

- A tactile learner: Learns best by touching, feeling, and manipulating objects.

- A kinaesthetic learner: Learns best with frequent opportunities for physical activity.
The RAMR CYCLE

Reality → Abstraction

Abstraction → Maths

Maths → Reflection

Reflection → Reality
**RAMR CYCLE**

**Reality**
- Identify local cultural and environmental knowledge that can be used to introduce the idea.
- Ensure existing knowledge prerequisite to the idea is known.
- Construct kinaesthetic activities that introduce the idea (and are relevant in terms of local experience).

**Abstraction**
- Develop a sequence of representational activities (physical to virtual to pictorial materials to language to symbols) that develop meaning for the mathematical idea.
- Develop two-way connections between reality, representational activities, and mental models through body → hand → mind activities.
- Allow opportunities to create own representations, including language and symbols.

**Critical Reflection**
- Set problems that apply the idea back to reality.
- Lead discussion of idea in terms of reality to enable students to validate and justify their own knowledge.
- Organise activities so that students can extend the idea (use reflective strategies – being flexible, generalising, reversing, and changing parameters).

**Maths**
- Enable students to appropriate and understand the formal language and symbols for the mathematical idea.
- Facilitate students’ practice to become familiar with all aspects of the idea.
- Construct activities to connect the idea to other mathematical ideas.
Number: ‘Counting’

AusVELS: Foundation

- Establish understanding of the language and processes of counting by name numbers in sequences.
- Connect number names, numerals and quantities, including zero, initially up to 10 and then beyond.
Reality

- Identify local cultural and environmental knowledge that can be used to introduce the idea.
- Ensure existing knowledge prerequisite to the idea is known.
- Construct kinaesthetic activities that introduce the idea (and are relevant in terms of local experience).

**Ten in the Bed**

Penny Dale
Abstraction

Role play from the book: "Ten in the Bed"

- Develop a sequence of representational activities (physical to virtual to pictorial materials to language to symbols) that develop meaning for the mathematical idea.
- Develop two-way connections between reality, representational activities, and mental models through body → hand → mind activities.
- Allow opportunities to create own representations, including language and symbols.
Mathematics

Created numerals with play dough.

Created a bed with wafers and candy bears.

- Enable students to appropriate and understand the formal language and symbols for the mathematical idea.
- Facilitate students’ practice to become familiar with all aspects of the idea.
- Construct activities to connect the idea to other mathematical ideas.
Reflection

Able to read, write, recognise and connect the number names, numerals and quantities.

Extension: Read another book “One is a Snail. Ten is a Crab”

- Set problems that apply the idea back to reality.
- Lead discussion of idea in terms of reality to enable students to validate and justify their own knowledge.
- Organise activities so that students can extend the idea (use reflective strategies – being flexible, generalising, reversing, and changing parameters).
Geometry: ‘Shapes’

AusVELS: Level 4 - 6
Year Four, Five and Six (7 students)

• Compare the areas of regular and irregular shapes by informal means
• Compare and describe two dimensional shapes
• Connect three-dimensional objects with their nets and other two dimensional representations
• Construct simple prisms and pyramids
Pre-Post Assessment ‘Quiz’ Results

All children showed huge gains in their own ability in understanding the questions.

1. Pre 42% Child A=98%
2. Pre 52% Child B=98%
3. Pre 32% Child C=88%
4. Pre 35% Child D=85%
5. Pre 56% Child E=92%
6. Pre 32% Child F=78%
7. Pre 25% Child G=68%
We made ANZAC Tiles or Hard tacks

The Big Idea (Reality)

- Identify local cultural and environmental knowledge that can be used to introduce the idea.
- Ensure existing knowledge prerequisite to the idea is known.
- Construct kinaesthetic activities that introduce the idea (and are relevant in terms of local experience).
Continue the Big Idea (Reality)

- Develop a sequence of representational activities (physical to virtual to pictorial materials to language to symbols) that develop meaning for the mathematical idea.
- Develop two-way connections between reality, representational activities, and mental models through body → hand → mind activities.
- Allow opportunities to create own representations, including language and symbols.
Reality
Abstraction
MATHEMATICS

Equilateral Triangle
(All sides the same length.)

An equilateral triangle has three sides, and three internal angles. All sides are the same length, and all angles equal 60°.

Isosceles Triangles
(Two sides the same length.)

The three kinds of isosceles triangles have two sides the same length, and two angles the same measurement.

Scalene Triangles
(All sides a different length.)

The three kinds of scalene triangles have no sides the same length, and no angles the same measurement.

Which is each kind of triangle? Write the name of the triangle inside each.

1. Obtuse
2. Right
3. Acute
4. Isosceles
5. Obtuse
6. Acute
7. Right
8. Equilateral
9. Isosceles
10. Equilateral
11. Scalene
12. Scalene

- Enable students to appropriate and understand the formal language and symbols for the mathematical idea.
- Facilitate students’ practice to become familiar with all aspects of the idea.
- Construct activities to connect the ideas to other mathematical ideas.
Making Visualization Connections
Using Maths Mat
Maths on the Measurement Mat
The possible activities can be used on the Maths Mat

**Number:**
Representations of types of numbers e.g. square numbers
Addition and subtraction
Calendars and other grids, 100 or 99 grids
Place value, pattern searching

**Patterns and Algebra:**
Relations and functions and backtracking.
Sorting attributes e.g. attribute blocks

**Space:**
**Shape and Line:**
2D and 3D representations
Symmetry
Tessellations
Flips, slides and turns

**Location, Direction and Movement:**
Maze, hidden treasure
Co-ordinates as in maps e.g. B5
Cartesian co-ordinates e.g. (3,2)
Directions using left and right, or N. S. E. W.
Strategy games e.g. battleships

**Measurement:**
Area
Perimeter
Length

**Chance and Data:**
**Chance:**
Throwing beanbags

**Data:**
People graphs
Questions
Thank You

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YuMiDeadly
Growing community through education