YuMi Deadly Maths

Prep Teacher Resource:

MG – Sensational shape hunt

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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ACKNOWLEDGEMENT

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refined and presented in professional development sessions.

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Prep Measurement and Geometry

Sensational shape hunt

Learning goal Students will compare shapes.

Content description Measurement and Geometry – Shape

- Sort, describe and name familiar two-dimensional shapes and three-dimensional objects in the environment (ACMMG009)

Big idea Geometry – shape – interpretation and construction

Resources Shapes in the environment, materials for making 2D and 3D shapes, twigs, leaves, bark, pebbles, pattern blocks, cardboard, boxes, cartons, lunch wrap cylinders, glue, sticky tape, string

Reality

Local knowledge Discuss shapes students can see in the local environment, e.g. animals, bushes, waterways – turtles, rocks, shells; in their backyard, classroom, shapes they see in the stars at night.

Prior experience Review students' knowledge of shapes, e.g. shapes they can draw, 2D shapes.

Kinaesthetic In small groups, students are taken on a "Sensational shape hunt" outside in the school grounds. They look around, observe and describe the shapes they see in the environment. They may stop to feel the straight or curved edges, the flat or rounded sides or surfaces. They compare shapes and find similar ones identifying the similarity. Experiment with shapes that roll or don't roll. Describe those shapes – *rounded shapes roll; flat shapes stand still and don't roll*. Put some shapes together or side by side and describe the similarities/differences. Sort into groups and describe how/why these objects belong together. Collect some shapes from the environment.

Abstraction

Body Students make the shapes they have seen with their bodies:

- 2D shapes – leaves (use fingers to outline a leaf), paths (arms stretched out), top platform of slippery slide (arms and chest), the slide itself (whole body). Then, different students make shapes together, e.g. the wall of the tuckshop, the triangular or gable end of the roof, any shape seen by the students. As each shape is made, students describe its features: straight/curved edges, flat/round surface or sides, corners/no corners, how it can be turned. *How would you sort these shapes? What shapes have corners/points/straight or curved edges, long and thin / short and wide?* (Give criteria for sorting.)
- 3D shapes – tree, monkey bar frame, tank, any shape seen by the students. Sort and describe features of the shapes. *How did you sort?*

Use students to make a small square (four students lying on the ground to form the four sides). Try to fit all the students into the space inside. *Is there enough room for everyone? If there's not enough space, how will we make a bigger shape?* Let students make a large rectangle using another two students to double the size. See how many can fit into this space. Compare with how many students fit into a circle made by students joining hands. *Which space held more/less?*

Students use some shapes to play with: balls, bats, kites, balloons, bubbles, sand castles, spades, buckets. Reverse: Students sort and describe the shapes they are playing with then the teacher gives a criterion and students find shapes/teacher shows shapes and students state the criterion/criteria (shapes may be sorted in different ways).

Hand	Students draw/paint all the shapes they have seen or made with their bodies or played with and describe the edges, surfaces, size, whether they are flat shapes (e.g. leaves) or solid shapes (e.g. balls). Sort the shapes into various categories and describe how they were sorted (criteria used).
Mind	Students suggest shapes they see made by the stars and students see those shapes in their mind, then draw those shapes in the air. Allow students to suggest shapes they could all draw in the air. Reverse: students open their eyes and teacher draws a shape in the air, e.g. circle, star and students suggest what the shape could be (there could be more answers than one.) Give practice going from shape to language (describing the features) and language to shape.
Creativity	Students select materials from the environment (bark, leaves, twigs, pebbles) or from home (boxes, cartons, plastic bottles) or combination and construct any shape they want using glue, sticky tape, string. They paint it and describe their shape or combination of shapes. They tell a story about how/where it would be used and display it in the classroom.

Mathematics

Language/ symbols	shape, line, corner, join, curved, straight, turn, side, compare, create, describe, face, edge
Practice	1. Students work in pairs to construct shapes using materials, drawings, or blocks and partners describe the shape that has been made. They discuss possible uses or features that would determine how the shapes were sorted. 2. Class makes a table of students' favourite shapes sorted into different categories. Go from language to find the objects ↔ objects and describe with appropriate language.
Connections	Connect to dimensions/measurement and symmetry of shapes.

Reflection

Validation	Ask students to describe the shape of familiar objects they see/have at home or at school. Each student describes the features of at least one object and other students may contribute by adding another feature where possible.
Application/ problems	Provide applications and problems for students to apply to different contexts independently; e.g. *Compare the shape of leaves/trees/pebbles with your partner using descriptive language such as: the corners are round/pointy, the edges are straight/curved, the surface is flat/ rounded, the side is rounded so it can roll*.
Extension	**Flexibility**. Students use various attributes to describe shapes and identify similarities that exist when they are comparing shapes. **Reversing**. Provide examples of going from object/s to language (describing features) to representation (e.g. drawing); then language to representation to object/s; representation to object/s to language. **Generalising**. Shapes are all around us in the world. Different shapes have different features/properties. The properties of a shape determine how it is described or named. **Changing parameters**. Challenge students to make and describe more complex and irregular shapes.

Teacher's notes

- Sorting shapes and discussing the properties in the sets that have been formed will help develop ability to categorise according to given criteria.
- Students need to be taught the skill of visualising: closing their eyes and seeing pictures in their minds, making mental images; e.g. show a picture of a shell, students look at it, remove the picture, students then close their eyes and see the picture in their mind; then make a mental picture of a different shell.
- Suggestions in Local Knowledge are only a guide. It is very important that examples in Reality are taken from the local environment that have significance to the local culture and come from the students' experience of their local environment.
- Useful websites for resources: www.rrr.edu.au; https://www.qcaa.qld.edu.au/3035.html
- Explicit teaching that **aligns with students' understanding** is part of every section of the RAMR cycle and has particular emphasis in the Mathematics section. The RAMR cycle is not always linear but may necessitate revisiting the previous stage/s at any given point.
- Reflection on the concept may happen at any stage of the RAMR cycle to reinforce the concept being taught. Validation, Application, and the last two parts of Extension should not be undertaken until students have mastered the mathematical concept as students need the foundation in order to be able to validate, apply, generalise and change parameters.