YuMi Deadly Maths

Year 4 Teacher Resource:

MG – My town

Prepared by the YuMi Deadly Centre
Faculty of Education, QUT

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YuMiDeadly
Growing community through education

ACKNOWLEDGEMENT

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Prepared by the YuMi Deadly Centre
Queensland University of Technology
Kelvin Grove, Queensland, 4059

ydc.qut.edu.au

Year 4 Measurement and Geometry

My town

Learning goal

Students will:

- use everyday language to give directions
- follow directions to locate positions on maps
- draw plans from a bird's-eye view.

Content description

Measurement and Geometry – Location and transformation

- Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090)

Big idea

Geometry – location, direction and movement

Resources

Pencil, Maths Mat, shoe boxes, cans, ice-cream containers, branches in pots, coloured paper squares

Reality

Local knowledge

What do we use to give/get directions in our local environment? [maps/plans] Discuss language that describes where something is located (e.g. beside, under, next to, near, between, above, opposite).

Prior experience

What are some symbols that you see on maps? What is the purpose of symbols and legends on maps and plans?

Kinaesthetic

Have students move a pencil or position bodies/hands/arms/legs to demonstrate directions and movements (e.g. forward, backwards, right, left, diagonally, parallel, adjacent). *Move your arms in a "clockwise" and "anticlockwise" direction. Show me a "full", "half" and "quarter" turn by turning your body/arms in the appropriate direction*. Reverse: Teacher moves body/arms/hands in various ways and students describe the movement that was made.

Walk around the school and make a map of the route being taken.

Abstraction

Body

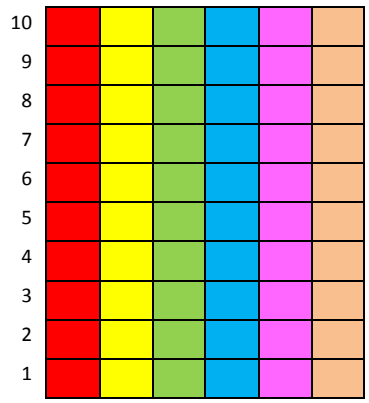
Maths Mat: Students stand on the Maths Mat and practise moving up/down/across 1/2/3 places and making quarter/half/full turns in clockwise/anticlockwise directions.

Students stand in a given place on the Maths Mat and do the following:

- move to a square that is in a diagonal position two squares away
- move to a square that is in a parallel line three rows forwards/backwards
- make a quarter/half/full turn clockwise/anticlockwise
- go to the adjacent square that is to your left/right/forwards/backwards
- go to a square two spaces down in a parallel column.

Play the GPS game: Groups of three – one blindfolded, one as the guide, one giving directions; e.g. *Turn left and walk forward four steps, turn right and take two steps sideways, make a full about turn and go one step backwards,* and so on. Change roles and repeat.

Find the hidden treasure: From a corner square on the Maths Mat, a student attempts to locate the "treasure" by following the directions given by the teacher. The student is out when a direction is not followed correctly and another student takes their place starting again from the initial square.



Where is it? Maths mat with each column from the x axis named a different colour and the rows on the y axis identified 1–10. Place objects on different squares and have students locate their position, e.g. *The teddy bear is on the pink row 5 square.*

Bird's-eye view: Students take the Maths Mat to a place where it is able to be viewed from a higher vantage point, e.g. veranda to ground, stage to floor of the hall. Boxes, cans, ice-cream containers, branches etc. are placed on the mat to represent the school buildings. The students then view the buildings from a higher vantage point to obtain a bird's-eye view.

Hand Using and cutting pieces of coloured paper to paste on an A4 or A3 sheet, students make a bird's-eye view map of the school with features such as the year level buildings, administration, tuckshop, hall, oval, cricket nets, swimming pool, adventure playground, using different colours identified in the map's legend.

Mind Students visualise the direction to take as nominated by the teacher. This may include directions that are classroom specific, e.g. *I am starting at my desk and I move four steps parallel to the whiteboard, I make a quarter turn clockwise (etc.) Where am I?* (Note: The directions must be a reflection of the teacher's view for the students to follow correctly.)

Creativity Students model their perfect bedroom in clay or plasticine and draw a bird's-eye view.

Mathematics

Language/ symbols legends, symbols, anticlockwise, clockwise, location, features, bird's-eye view

Practice

1. Students draw up identical grids with a partner. On one grid the students draw any five shapes in different cells. Students take turns to verbalise directions from a square in the bottom right corner. The partner will reproduce the five shapes on the empty grid.
2. Construct a map from the classroom to a selected secret school location. Share with a partner who has to identify the location by following the map.
3. Construct a map to show the route from your home to school.
4. Draw a map of a shopping centre and then construct the Information Board giving directions to the various shops.
5. View stimulus pictures of objects from a bird's-eye view.
6. Students draw a bird's-eye view map of the classroom including symbols.
7. Using the bird's-eye view map of the classroom, students work in pairs to write a set of instructions using directional language to guide each other from their desk to find given locations/objects in the classroom.
8. Compare information found in various maps and plans (e.g. city maps, street directory, treasure maps, maps from an atlas). Match symbols with the feature that they represent.

Connections Connect the bird's-eye view with cross-sections of solids.

Reflection

Validation

Students check where following directions and looking at maps are important, e.g. getting from one place to another when the way is unknown; finding your way to the shop you want in a different shopping complex.

Application/ problems

Provide applications and problems for students to apply to different contexts independently; e.g. Map a cross-country course with instructions using directional language, symbols and legend. Students create their own town maps: street map and bird's-eye view map including symbols and legends. Write a set of instructions using directional language to guide tourists from the Information Centre to various points of interest in the town, e.g. library, park, swimming pool, bank, shops, schools, the big M, petrol station/s.

Extension

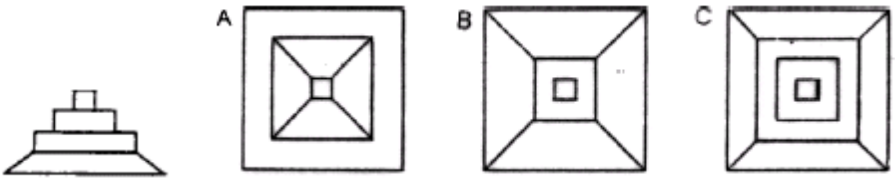
Flexibility. Students are able to give and follow directions in different contexts and see the difference in perspective from many angles.

Reversing. Students are able to construct meaning in mapping and following directions going from directions → map and map → directions. They interpret the map, construct the map and give directions.

Generalising. *Standard symbols are used to provide consistent language and understandings to help people interpret and follow directions; for example, north arrow, legend, bird's eye view, coordinates and symbols found on maps for features such as mountains, rivers, boundaries, hospitals, major landmarks. The view of objects may change depending on which face is being examined.*

Changing parameters. Make a 3D town with buildings, park, streets, bridges and so on, then draw the map. Draw the bird's eye view. Reverse: Given the map, make the town.

Solve this puzzle: *Which is the correct bird's-eye view of the building on the left?*



Teacher's notes

- Maps need to be named, e.g. Bird's-eye State School; show north's direction with an arrow pointing to the north and include a legend as a reference for reading the map. At a higher level, a scale would also be included.
- 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 kookaburra, 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 bird.
- 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.