**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 3 | STRAND: Measurement and Geometry | **SUB-STRAND:** **Position 2** | **WORKING MATHEMATICALLY:** MA2-1WM |
| OUTCOMES: MA2-17MG | **Uses simple maps and grids to represent position and follow routes, including using compass directions**  |
| **CONTENT:**  | **Use simple scales, legends and directions to interpret information contained in basic maps (ACMMG090)*** use a legend (or key) to locate specific objects on a map L
* use a compass to find north and then east, south and west
* use N, E, S and W to indicate north, east, south and west respectively, on a compass rose
* use an arrow to represent north on a map
* determine the directions north, east, south and west when given one of the directions
* use north, east, south and west to describe the location of a particular object in relation to another object on a simple map, given an arrow that represents north, e.g. ‘The treasure is east of the cave’L
* use NE, SE, SW an NW to indicate north-east, south-east, south-west and north-west, respectively, on a compass rose, e.g.
* calculate the distance between two points on a map using a simple given scale
* use scales involving multiples of 10 to calculate the distance between two points on maps and plans
* interpret simple scales on maps and plans, e.g. 'One centimetre on the map represents one metre in real life'

 (Reasoning) L\* give reasons for using a particular scale on a map or plan (Communicating, Reasoning) CCT* recognise that the same location can be represented by maps or plans using different scales CCT
 |
| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * **Pre Assessment**

**Use a compass rose to label as many directions as possible.****Use a grid to follow given instructions****Write directions to get from one point to another or from A to B to E to C on the map following the shortest route****Use a compass rose to label directions****(Working Beyond – label points of North-Northwest etc. 8 additional points on a compass)** |
| WARM UP / DRILL | * **Learning Sequence 1: (Warm Up): Buried Treasure**

The teacher hides mystery objects and gives simple compass directions and distances in paces from a starting point to enable students to find the objects.Variation: Students work in groups and carry out searches to find objects.* **Learning Sequence 2: (Warm Up): *Directionality with Compass Points (North, South, East and West)***

Place compass points around the room prior to the lesson. As a warm up activity play this game in partners. Child 1 choses a starting and finishing point (or spot) for child 2. Child 1 then directs child 2 using directional language such as “3 steps north” then “1 step east” etc. until they get to the finishing place. Children swap roles repeating activity..**ICT Warm Up (Links)** * ***Introducing Compass Points***

<http://www.iboard.co.uk/iwb/Flight-Rescue-Compass-Directions-420><http://www.bbc.co.uk/scotland/education/sysm/landscapes/highlands_islands/flash/index.shtml?flash=land_ms_compass><http://www.education.vic.gov.au/school/teachers/teachingresources/discipline/maths/continuum/pages/gridrefcompass30.aspx#a2>* ***The Compass Game Interactive***

<http://www.pbs.org/wgbh/nova/everest/earth/lost.html>* ***Google Maps***

<http://www.google.com/earth/>* Activities and worksheets

<http://www.primaryresources.co.uk/maths/mathsE6.htm>* ***Using a Compass Rose***

<http://eduplace.com/kids/socsci/books/applications/imaps/maps/g1_u3/>  |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  |   |
| QUALITY TEACHING ELEMENTS | **INTELLECTUAL QUALITY** | **QUALITY LEARNING ENVIRONMENT** | **SIGNIFICANCE** |
| * Deep knowledge
* Deep understanding

🗸* Problematic knowledge
* Higher-order thinking

🗸* Metalanguage
* Substantive communication
 | * Explicit quality criteria

🗸* Engagement
* High expectations
* Social support

🗸* Students’ self-regulation
* Student direction
 | * Background knowledge
* Cultural knowledge

🗸* Knowledge integration

🗸* Inclusivity
* Connectedness

🗸* Narrative
 |
| RESOURCES | **Digital and Interactive Resources****Maths K-6 Using Maths Tracks (Dept. of Education and Training Document) Space and Geometry- Position (Centre for Learning Innovation).** <http://www.curls.edu.au/search.php/all/position%202A> **Space and Geometry –Position Stage 2 NAPLAN** <https://edod.det.nsw.edu.au/PDFs/NAPLAN/2009/Links/numeracy/nn_spac/nn_spac_s2c09.htm>Metalanguage signage posters and cue cards to assist students with the positional language needed to complete learning activities.Other Digital and Interactive Links:***Refer to Warm Up ICT Links listed above*** |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| 🗌 Explicitly communicate lesson  outcomes and work quality.🗌 Teach and review***The relationship between coordinates and the use of a compass rose to locate position etc.***🗌 Define and Reinforce  metalanguage used in the lesson  sequences***Discuss and reinforce positional language:******Position, location, map, plan, path, route, grid reference, aerial view, legend, key scale, directions, coordinates, north, south, east, west, north-east, north-west, south-east, south-west, plot, legend, key, compass, compass rose.***🗌 Digital Resources:\* See above for digital resources | LEARNING SEQUENCERemediationS1 or Early S2 |  🗌 Have the students design and create a ***Treasure Map*** using the Pirate  Map Template and picture cards including compass rose. Have the students discuss their  map reinforcing the terminology north, east, south, west etc.🗌 Use a transparency grid template to lay over that includes compass rose and discuss how  we can use a compass and compass rose to assist with position, location and direction.🗌 Use the Digital Resources listed to reinforce and consolidate these concepts. |
| LEARNING SEQUENCES2 | 🗌 **Learning Sequence 1: Mystery Location** Students are asked to describe the location of an object in the classroom e.g. ‘North, east,  south, west.  Students write a description of the object using positional clues. The teacher collects the  clues and reallocates them back to the students. Students read the descriptions and locate  the object.  Extension: In pairs, Student A hides an object in the room while Student B turns away.  Student A gives Student B directions to find the hidden object. Student B then has a turn at  hiding the object. 🗌 **Learning Sequence 2: Maps and Compass Direction** **2A** Students ae given atlases or road maps and asked to locate north and then find other  compass points. Students use the compass rose and use N, S, E or W to describe the  location of a point on a map. Students are asked to find places on a map that are in a  given direction from a starting point e.g. find a town which is due north of Cairns.  Students are asked to [pose their own questions using directional language. **2B** **Distance and Direction**Students use the scale on a map of NSW and the compass rose to find a town e.g. 300km  NE of Perth, 270km SW of Sydney. Students are encouraged to create their own  cards with distance, direction and starting place on one side and the town on the back.  The students swap cards with other students and repeat the activity.🗌 **Learning Sequence 3: Using street Directories**Students are given a simple map of a town with grid lines superimposed. They find places on  the map, given coordinates. Students give the coordinates of particular places on the map. Students use a page of a street directory or a map of the town in which they live. Students  are asked to give the coordinates of: . where you live . your school . the shopping centre. Students are asked to state what buildings or physical features are shown on the map at  Particular grid references e.g. ‘What would we find if we walked to A 12, C 5, and J 17 etc.?’ Possible questions include: . How many different ways can you get from one point to another? . What does …….. represent on your key or legend? Where can I find it on the map? . Can you describe the location of an object in relation to a landmark? . What coordinates or directions can you use to identify the ………………… (landmark)? . Can you determine the directions N, S, E and W on the map? How did you know? What  could you use to check? . Can you identify NE, NW, SE and SW on the map? Can you identify a landmark NW of...?🗌  **Learning Sequence 4: Using a Compass** **4A** In small groups in the playground, students use a compass to locate the directions N, S, E  and W. Students mark on the ground a grid with sufficient spaces for each student in the  group to have a space of their own. A leader is chosen and blindfolded to call out compass directions i.e. North, South, East,  and West. Students follow the directions, moving one grid space at a time, until they are  off the grid and ‘out’. Players must call ‘I’m out’ when they are off the grid. The last  student to survive wins and becomes the new leader. The game can be extended, giving  directions of North-East, North- West, South-East and South-West. Students could  experiment with rule changes to add further interest to the game. ***Variation: Students could do the same activity in the classroom using grid paper***  **4B Orienteering**  Students design and measure a simple orienteering course in the school grounds. They  create a set of instructions on a map with a grid, a scale and compass directions to each  place to be located. They give their instructions to another student to follow.   |
| LEARNING SEQUENCEExtension Late S2 or Early S3 | **Differentiation****🗌 Learning Sequence 1**: (Investigating the Compass) ***Differentiation*** Design an orienteering course within the school grounds using a compass and compass rose.  |
| **EVALUATION & REFLECTION** | * Students complete the assessment task on Position 2 (See attached sheets)
* Design a cross country course or bike track within the school grounds.

See attached assessment.  |

* All assessment tasks should be written in **red** and planning should be based around developing the skills to complete that task.
* Assessment rubrics or marking scale should be considered.