**MATHEMATICS STAGE 2**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 6 | **STRAND:** Measurement and Geometry | **SUB-STRAND:** Angles 2 | **WORKING MATHEMATICALLY:**

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|  MA2- WM  |

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| OUTCOMES: MA2-16MG |

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| **Identifies, describes, compares and classifies angles MA2-16MG**  |

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| **CONTENT:**  | **Compare angles and classify them as equal to, greater than or less than a right angle** (ACMMG089)* Identify the arms and vertex of an angle in an opening, a slope and/or a turn where one arm is visible and the other arm is invisible, eg the bottom of an open door is the visible arm and the imaginary line on the floor across the doorway is the other arm.
* Create, draw and classify angles of various sizes, eg by tracing along the sides of shapes.
* Draw and classify the angle through which the minute hand of the clock turns from various starting points (communicating, reasoning)
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| **ASSESSMENT FOR LEARNING**  **(PRE-ASSESSMENT)** | * Use the angles pre-assessment (resource 1) to assess student knowledge of types of angles. Students may colour right angles red, acute angles blue and obtuse angles green.
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| **WARM UP/ DRILL** | * Make angles on the geoboard and compare the number of sides and corners of the shapes they have created.
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| 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
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| RESOURCES | Teaching about angles (stage 2), rulers, geoboards |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **Explicitly communicate lesson outcomes and work quality.**
* **Teach and review** angles eg, right angles, obtuse, acute and discuss the terminology used to describe angles such as horizontal.
* **Demonstrate** how to use a bent straw to measure and draw the angle on the whiteboard. Use the draw to compare the size of the drawn angle with the angle of an object with an acute angle.
* **Classify**
	+ Students classify angles using the attribute of angle size (i.e., small angles, medium, large, wide …) Display, describe and define the different types of angles as acute (less than 90˚) right (equal to 90 ˚) obtuse (greater than 90 ˚ and less than 180 ˚) Identify these angles within the classroom.
* **Questioning:**
* This tabletop is horizontal. What does this mean?
* Is this ruler horizontal? Does it stay horizontal when I move it about?
* How does the sloping ruler make an angle? What can you tell us about the parts of this angle?
* What slopes in our playground can we measure?
* How can you describe the angles at the corners of each shape?
* Are the angles at the corners of each shape the same or different?
* What happens when you place an angle from a square on top of an angle at the corner of a hexagon?
* Can you describe the difference?
* **Identify and describe** the angles made by a turning clock hand. Discuss how turns of the clock hand make an angle.
* **Discuss** the angle of an opening door by looking at the top edge and then the bottom edge. Discuss how to visualise the arm formed by the doorway at the bottom edge.
 | LEARNING SEQUENCERemediationLate S1 |  |
| LEARNING SEQUENCES2 | * **Clock faces**
	+ Working in pairs, students explore various turns of clock hands and the angles they make. Students can draw the hands on a clock to create different types of angles.
* **Measuring angles of slope**
	+ Students use sloping rulers to identify and investigate angles of slope. Students measure angles of slope with pattern blocks and record by drawing and labelling the angles.
* **Measuring angles of slope**
	+ Students measure slopes identified in the playground.
* **Adventure scavenger hunt**
	+ Students list as many angles (right, acute, obtuse ….) as they can find.
* **Doors that open in different directions**
* Students investigate the angle of opening in doors that open in different directions.
	+ Students use pattern block corners to measure and draw the angle of opening of all doors on the house activity sheet.
* **Drawing two-line and one-line angles-**
* Students match two-line and one-line angles in different situations and explain the main
* features of an angle.
* **Drawing and comparing**
	+ Students investigate angles on the geoboard and compare the number of sides and corners of the shapes they have created. Students transfer shapes to dot paper and record the name of the shape, the number of sides and the number of corners.
* **Acute and obtuse angles**
* In groups of 3, students take turns to make angles with their bodies as instructed by the teacher.
* Students look for acute and obtuse angles in the classroom. They make drawings of the angles, compare the angles with the corners of pattern blocks, and classify the angles according to size.
* Teacher calls out a variety of angles for students to make using their arms.
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| LEARNING SEQUENCEExtension Early S3 | * **Geoboards:** Provide students with geo boards and elastic bands. Have them explore and make a range of adjacent angles. Have pairs of students work together and pose problems for their partners to create. I.e. “Create a complimentary angle that has one angle of 300.”

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| **EVALUATION & REFLECTION** | 1. What type of angle is on the board?
2. What makes it an … angle?
3. How can we determine its an …. angle?
4. What other angles in the classroom/ playground match this angle?
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* 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.