**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM: | WEEK: 3 | STRAND: Measurement & Geometry | **SUB-STRAND:** Angles 1 | **WORKING MATHEMATICALLY:**  MA3-1WM |
| OUTCOMES: MA3-16MG | | **Measures and constructs angles, and applies angle relationships to find unknown angles.** | | |
| **CONTENT:** | | **Estimate, measure and compare angles using degrees.**   * Explore and explain how to use a semicircular protractor to measure a [reflex](http://syllabus.bos.nsw.edu.au/glossary/mat/angle-classification/?ajax" \t "_blank" \o "Click for more information about 'reflex') angle (Communicating, Reasoning) CT * Extend the arms of an angle where necessary to facilitate measurement of the angle using a protractor (Problem Solving) CT | | |
| ASSESSMENT FOR LEARNING (PRE-ASSESSMENT) | | * Students describe the features of acute, obtuse and reflex angles and list possible measurements of reflex angles and explain how students came up with these answers. | | |
| WARM UP / DRILL | | Locate, make (using geo-strips) and draw different reflex angles in the environment.  Play: Angle Jeopardy game  **http://www.math-play.com/Angles-Jeopardy/Angles-Jeopardy.html** | | |
| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION | | The blades on a propeller turn and then pause. After 25 seconds the propeller blades begin moving again and rotate another 80 degrees to complete a full 360 degrees. How many degrees did the blades turn before they paused? | | |
| 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 | | Protractor, coloured circle paper, IWB, paper | | |

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES | |
| Explain that there are 2 scales on a protractor. Have students identify the 2 scales.Demonstrate how to use the protractor and the 2 scales.  * On the floor give students angle to measure, check and re-explain and model until all students are confident. * Use a clock to revise and teach rotation. Discuss that there is 360 degree in one rotation of the minute hand. | LEARNING SEQUENCERemediationS2 or Early S3 | * **Straight lines:** * In pairs, students create angle starting with a straight line. The first student draws a straight line and then makes an acute angle. The first student measures the acute angle and writes it down. The second student works out the obtuse angle by subtracting the acute angle from 180 degrees. Check the answer my using the scale on the protractor to measure the obtuse angle. |
| LEARNING SEQUENCES3 | * **Measuring reflex angles:**   Have student identify and draw a variety of reflex angles. Discuss their features.  Demonstrate and model.  Step 1: Measure the angle on the other side of the reflex angle.  Step 2: Subtract this measurement from 360.   * In pairs, have students draw and then measure their own reflex angles. Have their partners check measurements. * Students draw, estimate and then measure their reflex angles. * **Angle Wheel Display:**   Students construct an angle wheel but cutting two identical circles of different coloured paper. Slits are cut to the centres of each circle. The circles then overlap, with the slits together. The lower right part of the top circle is slipped under the upper right part of the bottom circle to make a wheel.  Students use the wheel to make different angles. In pairs, one student makes an angle and the other student estimates its size and then measures it in degrees. |
| LEARNING SEQUENCEExtensionEarly S4 | * **360 Degree Protractor:** * Have students construct their own 360 degree protractor by placing dots at 10 degree intervals around the protractor above and below the baseline, then joining the dots to the centre point. |
| **EVALUATION & REFLECTION** | Is the student able to identify, draw and measure reflex and obtuse angles? |