**MATHEMATICS STAGE 3**

**TEACHING AND LEARNING OVERVIEW**

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| TERM:  | WEEK: 2 | 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.*** Measure angles of up to 360° using a protractor.
* Explain how a protractor is used to measure an angle (Communicating) http://syllabus.bos.nsw.edu.au/wsimages/cca/l.png

**Construct angles using a protractor.*** Construct angles of up to 360° using a protractor.
* Identify and describe [angle size](http://syllabus.bos.nsw.edu.au/glossary/mat/angle-classification/?ajax" \t "_blank" \o "Click for more information about 'angle size') in degrees for each of the classifications acute, obtuse and reflex
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| ASSESSMENT FOR LEARNING(PRE-ASSESSMENT) | * Students compare and estimate the size of different angles.
* Students explain the features of a protractor.
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| WARM UP / DRILL | * Students construct a variety of different sized angles which they then name and describe.
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| TENS ACTIVITYNEWMAN’S PROBLEMINVESTIGATION  | A ceiling fan rotates 75 degrees and then stops. How many more degrees does it need to rotate in order to make a full rotation?* Tom is editing a photograph on his laptop. He rotates the photograph 120 degrees clockwise. He then rotates it another 160 degrees clockwise. If he continues turning the photo in a clockwise movement how many more degrees will Tom need to turn it to have made a complete 360 degree turn?
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| 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 | Protractors, analogue clocks, geo-strips, paper, pencil |

**TEACHING AND LEARNING EXPERIENCES**

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| WHOLE CLASS INSTRUCTION MODELLED ACTIVITIES | GUIDED & INDEPENDENT ACTIVITIES |
| * **Using Protractors**

Students are shown how to use protractors to measure angles in degrees. The teacher ensures that students are aware of: * The scale around the edge
* The point on the protractor to be aligned with the vertex of the angle to be measured
* The reason for two sets of numbers
* The largest angle that can be measured
* The need to line up an arm of the angle being measured with the zero degree line on the protractor, not its bottom edge.

In pairs, one student estimates the size of an angle and the other student checks the estimate by measuring with the protractor. | LEARNING SEQUENCERemediationS2 or Early S3 | * **Clocks**

Students identify and describe the angles made by a turning clock hand. Discuss the time which makes the largest angle, smallest, right angle, straight etc. Compare features of different angles. |
| LEARNING SEQUENCES3 | * **Constructing Angles**

In pairs, students draw ten different angles for each other. Students then measure, label and order their partner’s drawings. * **Drawing Triangles:**

Give students a description of different triangles and ask them to draw, name and label different triangles (right angled, equilateral, isosceles and scalene).* **Angling**

In pairs, students take turns to nominate the size of an angle eg 50º. Both students estimate and draw an angle of the nominated size. Students use a protractor to measure their partner’s angle. The student whose angle is closer to the nominated measurement is the winner.*Variation:* Students create two sets of cards, one with a range of angles drawn on them and the other with the measured size of the angles. They play a concentration game with the cards. |
| LEARNING SEQUENCEExtension Early S4 | * *Extension:*

Students replicate angles in the room using geo-strips. They then copy the angels onto paper and estimate and measure the angles. |
| **EVALUATION & REFLECTION** | Is the student able to measure and draw angles using degrees?Is the student able to identify angles in a triangle or identify a triangle using it’s angles? |