**ANGLES 1 – STAGE 3**

**OUTCOMES**

A student:

* MA3-1WM - describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions
* MA3-16MG - measures and constructs angles, and applies angle relationships to find unknown angles

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| CONTENT | plan |
| **Estimate, measure and compare [angles](http://syllabus.bos.nsw.edu.au/glossary/mat/angle/?ajax" \t "_blank" \o "Click for more information about 'angles') using degrees (ACMMG112)** |  |
| identify the arms and vertex of an angle where both arms are invisible, such as for [rotations](http://syllabus.bos.nsw.edu.au/glossary/mat/rotation/?ajax" \t "_blank" \o "Click for more information about 'rotations') and rebounds | 1 |
| recognise the need for a formal unit for the measurement of angles | 1 |
| record angle measurements using the symbol for degrees (°) http://syllabus.bos.nsw.edu.au/wsimages/cca/l.png | 1 |
| measure angles of up to 360° using a protractor | 2 |
| explain how a protractor is used to measure an angle (Communicating) http://syllabus.bos.nsw.edu.au/wsimages/cca/l.png | 2 |
| 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 | 3 |
| extend the arms of an angle where necessary to facilitate measurement of the angle using a protractor (Problem Solving) CT | 3 |
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| **Construct angles using a protractor (ACMMG112)** |  |
| construct angles of up to 360° using a protractor | 2 |
| identify that a [right angle](http://syllabus.bos.nsw.edu.au/glossary/mat/right-angle/?ajax" \t "_blank" \o "Click for more information about 'right angle') is 90°, a [straight angle](http://syllabus.bos.nsw.edu.au/glossary/mat/straight-angle/?ajax" \t "_blank" \o "Click for more information about 'straight angle') is 180° and an angle of [revolution](http://syllabus.bos.nsw.edu.au/glossary/mat/revolution/?ajax" \t "_blank" \o "Click for more information about 'revolution') is 360° | 1 |
| 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 | 2 |
| use the words 'between', 'greater than' and 'less than' to describe angle size in degrees (Communicating) http://syllabus.bos.nsw.edu.au/wsimages/cca/l.png | 1 |
| compare the sizes of two or more angles in degrees, eg compare angles in different two-dimensional shapes CT | 4 |
| estimate angles in degrees and check by measuring | 4 |

**ANGLES 2 – STAGE 3**

**OUTCOMES**

A student:

* MA3-1WM - describes and represents mathematical situations in a variety of ways using mathematical terminology and some conventions
* MA3-16MG - measures and constructs angles, and applies angle relationships to find unknown angles

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| CONTENT | plan |
| **Investigate, with and without the use of digital technologies, angles on a straight line, angles at a point, and [vertically opposite angles](http://syllabus.bos.nsw.edu.au/glossary/mat/vertically-opposite-angle/?ajax" \t "_blank" \o "Click for more information about 'vertically opposite angles'); use the results to find unknown angles (ACMMG141)** |  |
| identify and name angle types formed by the intersection of straight lines, including [right angles](http://syllabus.bos.nsw.edu.au/glossary/mat/right-angle/?ajax" \t "_blank" \o "Click for more information about 'right angles'), 'angles on a straight line', 'angles at a point' that form an angle of [revolution](http://syllabus.bos.nsw.edu.au/glossary/mat/revolution/?ajax" \t "_blank" \o "Click for more information about 'revolution'), and 'vertically opposite angles' http://syllabus.bos.nsw.edu.au/wsimages/cca/l.png | 5 |
| recognise right angles, angles on a straight line, and angles of revolution embedded in diagrams (Reasoning) | 5 |
| identify the vertex and arms of angles formed by intersecting lines (Communicating) | 5 |
| recognise vertically opposite angles in different orientations and embedded in diagrams (Reasoning) | 6 |
| investigate, with and without the use of digital technologies, [adjacent angles](http://syllabus.bos.nsw.edu.au/glossary/mat/right-angle/?ajax" \t "_blank" \o "Click for more information about 'adjacent angles') that form a right angle and establish that they add to 90° | 7 |
| investigate, with and without the use of digital technologies, adjacent angles on a straight line and establish that they form a [straight angle](http://syllabus.bos.nsw.edu.au/glossary/mat/straight-angle/?ajax" \t "_blank" \o "Click for more information about 'straight angle') and add to 180° | 7 |
| investigate, with and without the use of digital technologies, angles at a point and establish that they form an angle of revolution and add to 360° | 7 |
| use the results established for adjacent angles that form right angles, straight angles and angles of revolution to find the [size of unknown angles](http://syllabus.bos.nsw.edu.au/glossary/mat/angle-classification/?ajax" \t "_blank" \o "Click for more information about 'size of unknown angles') in diagrams CT | 8 |
| explain how the size of an unknown angle in a diagram was calculated (Communicating, Reasoning) CT | 8 |
| investigate, with and without the use of digital technologies, vertically opposite angles and establish that they are equal in size | 8 |
| use the equality of vertically opposite angles to find the size of unknown angles in diagrams | 8 |