

Maths Planner Year Level: 6

Strand /Topic: 2D Shape and Measuring Angles (to be done after area due to connections)

Duration: 3 weeks (approx)

Links to UOI: Visual Arts- Enlarge chair image using grid - congruent shapes & identifying angles for positive-negative art image. ° Examine types of angles in cubist artworks

Central Idea: When angles co-exist, connections and relationships are formed.

Lead In Provocation:

Draw types of angles- some wavy, congruent (same) straight: an angle forms when two straight lines intercept

Draw lines- parallel, perpendicular

G1: Angle hunt: return telling us which types of angles they found the most of and why they think so

G2: 3 vertical and 3 horizontal lines - measure angles using protractor

Post it: Can an angle exist alone? Explain why or why not.

PYP Phase Conceptual Understanding:	Outcomes:	Lines of Inquiry & Learning Experiences:
° Geometric tools and methods can be used to solve problems relating to shape and space.	° Describe, measure and construct types of angles: obtuse, acute, straight, reflex, right ° Understand that geometric ideas and relationships can be used to solve problems in other areas of mathematics and real life. identifying and naming right-angled triangles	FORM: Identify what right-angled, isosceles, equilateral and scalene triangles are like <u>Investigating triangles & what their angles add up to</u> FUNCTION: How we can measure in degrees and construct angles using a protractor - students given two congruent equilateral triangles printed out. first triangle measure the area and then use protractor to measure the angles. are the angles congruent? what other properties does an equilateral triangle have? on second

	• manipulating, identifying and naming isosceles, equilateral and scalene triangles • comparing and describing side properties of isosceles, equilateral and scalene triangles • exploring by measurement angle properties of isosceles, equilateral and scalene triangles by measuring • exploring by measurement angle properties of squares, rectangles, parallelograms and rhombuses	<i>triangle, cut off the angles and see if can arrange in a line. What do the angles add up to? What type of angle does this equal? = straight angle is 180° Use coloured paper to draw and cut out different types of congruent triangles (fold paper over to get two triangles). Repeat: 1 name the type of triangle, measure the area, measure the angles, cut angles off the second triangle and place together like a straight angle, do they add up to 180°? DISCOVERY: the angles of every triangle add up to 180°</i> <i>Display types of triangles on data screen for reference</i> - <i>Next day repeat with quadrilaterals - find out what all their angles add up to - 360° What connection can we make between the 180 and the 360° Why is it this way?</i> <u>Investigating triangles & what their angles add up to</u> <i>EXTENSION: students who already know this in pre.assessment explore square-based pyramids</i> <u>Great Pyramid of Giza investigation</u> - <i>Human triangles: split class in half. call a triangle- group makes the triangle the fastest with their bodies wins a point</i> - <i>Student A given a map of an archipelago to navigate a ship through using angles and compass bearings. Student B listens to directions and draws the route the ship takes. Lead in activity: Write robot directions for partner B to follow. Eg, walk forward 3 steps. Turn 45° to the right.....</i> <i>FUNCTION: How we can classify angles as right, acute, obtuse, reflex, straight or a revolution</i> - <i>after pre-assessment, discuss, draw and measure different types of angles</i> - <i>do studyladder protractor together on data screen (always ask self first . is it acute or obtuse to know whether to use inside or outside numbers first)</i> <i>Lead in activity:</i> <i>Angle hunt - 15 mins walk around school finding objects with different types of angles. Discuss - what angles do we find more commonly?</i> <i>Game: 1, 2, 3 call an angle. Students create an angle with their arm - if called out, eliminated</i> <i>NEXT: Review area of shapes</i> <i>Give hexagonal prism & hexagonal pyramid (lower group pentagonal) nets. Identify number of faces, edges, measure the angles with a protractor-be mindful of congruent angles, then <u>measure the entire surface area of the net.</u></i> <i><u>Open enquiry:</u></i>
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		<u>Angles enquiry into central idea: When angles co-exist connections & relationships are formed</u> - if we make one angle in a triangle larger, what effect does it have on the other angles? How do they co-exist? With quadrilaterals?
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Pre-assessment: Which lines of inquiry will we assess student understanding at the beginning of the unit? How?	Summative assessment: Which lines of inquiry will we assess student understanding at the end of the unit? How?
<i>FUNCTION: How we can classify angles as right, acute, obtuse, reflex, straight or a revolution</i> ° draw and measure using a protractor as many different types of angles as you can remember ° Draw different angles- straight, wavy, congruent and discuss must be straight lines ° Can 1 angle exist alone without another angle forming? Prove your theory in at least 3 different ways. ° Angle hunt - 15 mins walk around school finding objects with different types of angles. Discuss - what angles do we find more commonly? WHY? Predict first- which type of angle you will find the most and the least. <i>FORM: Identify what right-angled, isosceles, equilateral and scalene triangles are like</i> ° draw as many different triangles as you know & identify their properties ° what do all the angles of a triangle & a quadrilateral add up to	<i>FUNCTION: How we can classify angles as right, acute, obtuse, reflex, straight or a revolution</i> <i>FUNCTION: How we can measure in degrees and construct angles using a protractor</i> ° draw three vertical and three horizontal lines on a page. Identify type of angle & measure using a protractor ° draw 4 times on an analogue clock that show 4 different types of angles <i>FORM: Identify what right-angled, isosceles, equilateral and scalene triangles are like</i> ° arrange the types of triangles into a 'royal family tree' - which triangle would king, queen, prince, peasant etc based upon their properties ° what triangle am I? quiz game - clues based on angles

Student- initiated inquiries or questions raised that were used in the learning:

- ° Is there a pattern for the exterior angles of polygons?

- ° Is a 100 sided shape called a centagon?
- ° What do all the angles of a hectagon equal?
- ° What do all the angles of 3D shapes equal? Is there a pattern?
- ° If the 3 angles on a corner of a cube equal 270, will the angles of a pyramid also equal 270? Why or why not?

Resources:

- studyladder protractor activities to display on data screen
- Lower/mid group:
- [*Investigating triangles & what their angles add up to*](#)
- Extension group:
- [*Great Pyramid of Giza investigation*](#)

Reflection:

What worked well for next time?

What didn't work well for next time?

Ways to improve how to differentiate for next time?

- ° to cut off the angles of the equilateral triangle to try to form as a straight angle, they need to cut on the angle lines. Next time, have them line the 3 angles up against a ruler to make the thinking activity easier for those who might struggle. If don't cut to the edge of the angles it is a nightmare!
- ° open enquiry into the central idea- amazing!
- ° doing studyladder protractor on data screen helped a lot in showing how to use a protractor! Circle protractors are crap- buy semi-circle ones next year.