| Subject | Year | Month | |
|---|---|---|---|
| **Mathematics** | 7 | January | Balcarras From strength to strength |

## Topic:

ANGLE FACTS AND PROPERTIES OF 2D SHAPES — 5 LESSONS

## Content (Intent)

### Prior Learning

KEY STAGE 2

- Know that vertically opposite angles are equal
- Know that angles on a straight line add up to 180°
- Know that angles about a point add up to 360°
- Types of triangles
- Types of quadrilaterals

PREVIOUS UNIT:

- parallel, perpendicular
- notation for equal sides, parallel sides, right angles

### Future Learning

**Y7**
3D shapes
Perimeter, surface area, volume

**Y8**
Bearings (in which bearing of A from B vs. B from A might or might not have been mentioned)

**Y8**
Angles on Parallel lines
Angles in polygons

### Objectives

Constant application of the previous unit "geometric notation"

Recognise and solve problems using …

- vertically opposite angles, angles at a point, on a straight line (COVERED IN KS2)
- angles in a triangle (COVERED IN KS2)

- Know and solve problems using the properties and definitions of **triangles**
- Know and solve problems using the properties and definitions of special types of **quadrilaterals** (including diagonals)

Challenge: combine angle facts and algebra. But remember they have not seen solving equations yet, so simple examples.

- **Line** symmetry and **rotational** symmetry in 2D shapes

### For teaching purposes

POSSIBLE QUESTIONS

- Show me an example of a trapezium. And another …
- Which quadrilaterals are special examples of other quadrilaterals? Why? Can you create a 'quadrilateral family tree'?
- What is the same and what is different: Rhombus / Parallelogram?
- Show me possible values for a and b. And another.

POSSIBLE MISCONCEPTIONS

- may think that all trapezia are isosceles or have one right angle
- may think that a diagonal cannot be horizontal or vertical
- may think that a 'non-horizontal' square is called a diamond
- The equal angles of an isosceles triangle are not always the 'base angles'
- Calculating mistakes when adding/subtracting mentally. E.g 180 – 127 = 63°.

## Pedagogical notes (implementation)

**Notation**
Dash for equal lengths
Arc for equal angles
Right angle notation
Parallel line arrow heads

Make the connection between the SUM of the angles in a triangle and the SUM of angles on a straight line by drawing any triangle, rip off the corners of triangles and fitting them together on a straight line.
(The official proof will be discussed in Year 8, using angles on parallel lines.)

*The word 'isosceles' means 'equal legs'. What do you have at the bottom of equal legs? Equal ankles!*
**Kite**, not 'diamond' , A **square** is a rectangle with extra features.
A **rhombus** is a parallelogram with extra features

## How will understanding be assessed & recorded (Impact)

**End of term** Assessment in February
**End of Year** Assessment in June / July
**BAM task –** Geometric notation and 2D shapes

## How can parents help at home?

**MathsWatch clips (Qualification KS3)**
G1, G13, G14, G16, G17

## Further reading/discussion

### Reading / Enrichment

KM: Dotty activities:
KM: What's special about quadrilaterals?
NRICH: A chain of polyhedra
NRICH: Property chart
NRICH: Quadrilaterals game
KM: Maths to Infinity: Lines and angles
KM: Stick on the Maths: Angles
NRICH: Triangle problem
NRICH: Square problem
NRICH: Two triangle problem
KM: Rotational symmetry

### Literacy

Diagonal, Perpendicular, Parallel
Vertically opposite
Triangles: Scalene, Right-angled, Isosceles, Equilateral
Quadrilaterals: Square, Rectangle, Parallelogram, (Isosceles) Trapezium, Kite, Rhombus
Symmetry (line vs rotational)

### Numeracy Links

### Careers Links

Engineer
Architect
Carpenter