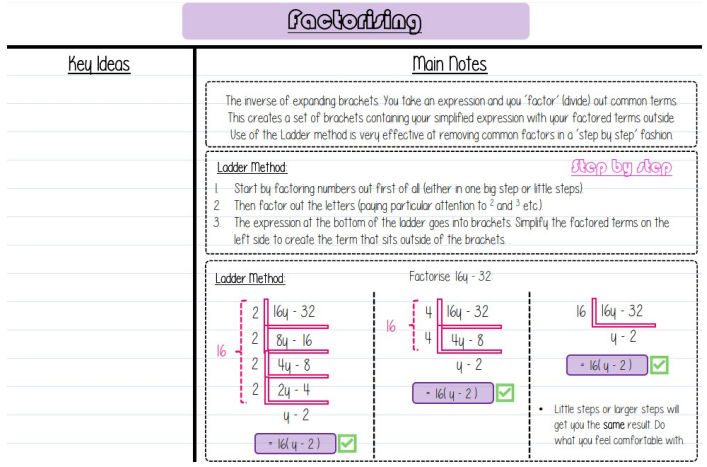
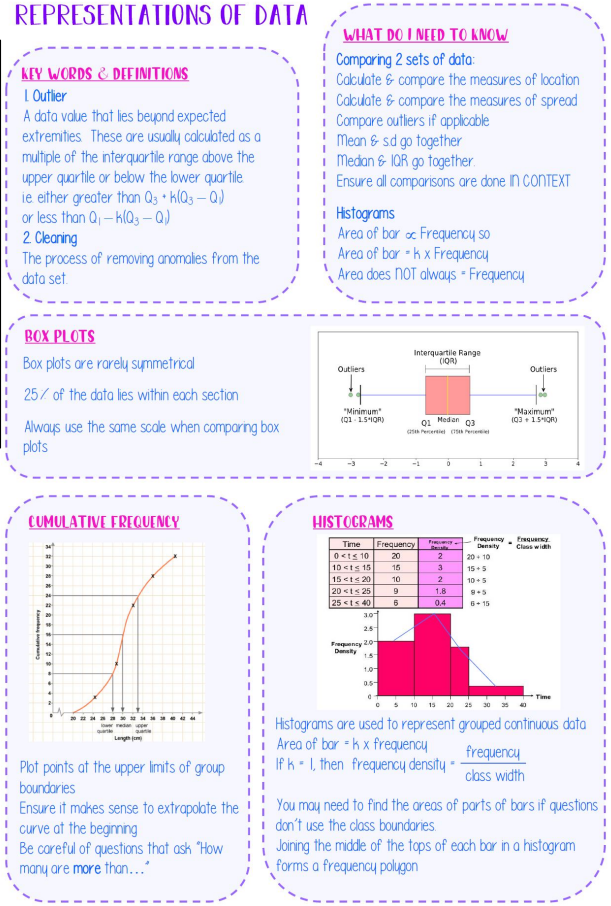
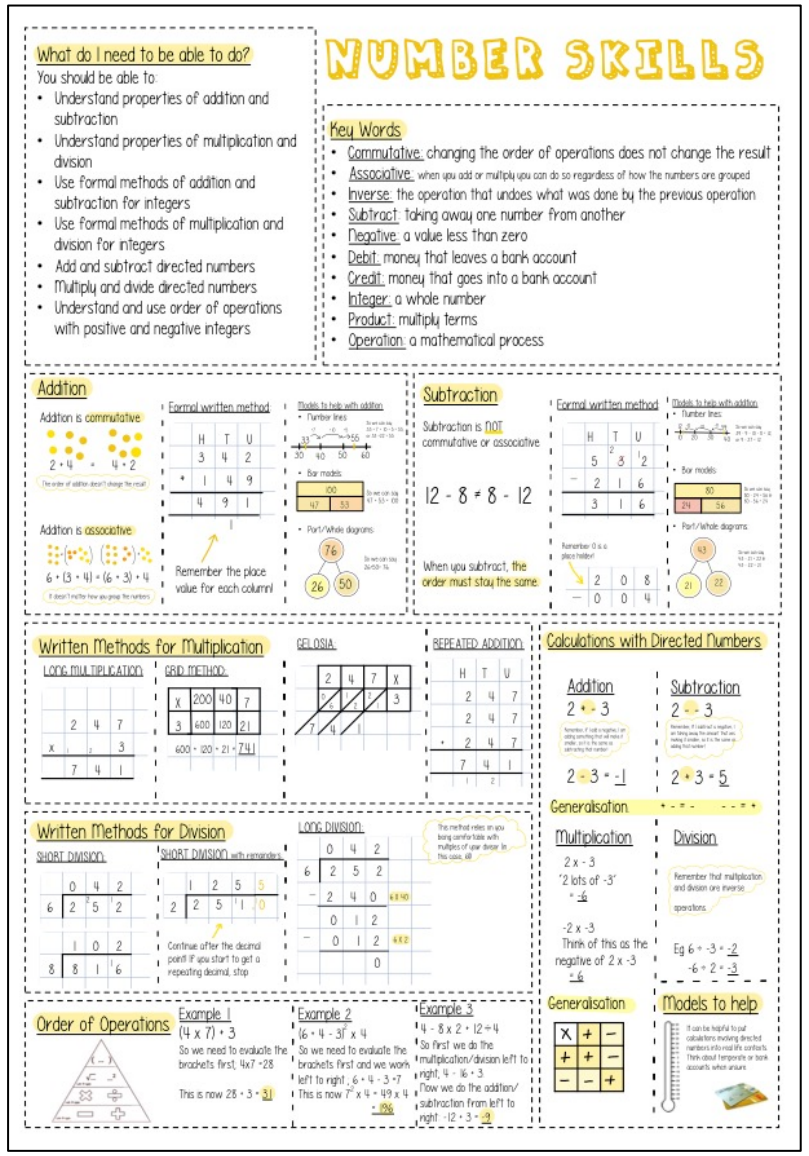
Knowledge Organisers

5. Knowledge Organisers – Create a one-page document that outlines the most important knowledge a student needs to engage in a unit of learning.





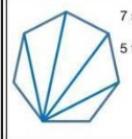
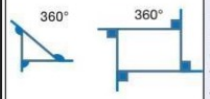
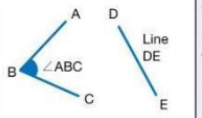
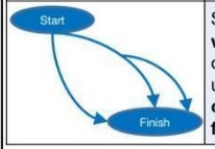


What would a Knowledge Organiser look like for your class this term? Work with a partner and develop an Organiser.

Geometry Knowledge Organizer

5H Angles and Trigonometry
5a Polygons, angles and parallel lines

Important ideas

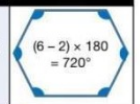
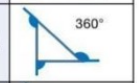
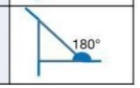
	The **sum of the interior angles** in a **polygon** can be calculated by thinking about the **number of triangles** that can fit inside the polygon. This is always **2 less than the number of sides**
	It doesn't matter how many sides a polygon has, the **exterior angles always add up to 360°**. If you cut them out, they would form a whole turn
	When solving angle fact problems you must use **three-letter angle notation**, **two-letter line notation** and **state every angle fact** you use to tell the 'logical story' of how you solved the problem
	Sometimes there is **more than one way** to solve an angle fact problem. It doesn't matter which approach you use so long as it is **mathematically correct** and you **state all the angle facts** you use

Important vocabulary

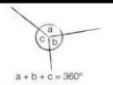
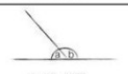
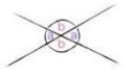
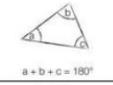
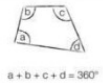
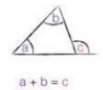
Polygon	A **2D shape** made from 3 **straight sides** or more
Regular polygon	A **polygon** with **all sides equal** in **length** and **all interior angles equal** in size
Isosceles triangle	A triangle with **two equal length sides**. The two **base angles are equal** in size
Equilateral triangle	A triangle with **three equal length sides**. The **three interior angles** are **equal** in size
Interior angle	An angle between **two adjacent sides inside** a **polygon**
Exterior angle	An angle between a **side of a polygon** and an **adjacent side extended outward**
Parallel	**Lines** that have the **same distance continuously between** them. They **never intersect**

Key facts to memorise- polygon angle facts

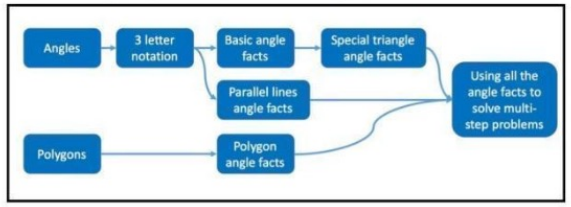
Polygon names	
3 sides	Triangle
4 sides	Quadrilateral
5 sides	Pentagon
6 sides	Hexagon
7 sides	Heptagon
8 sides	Octagon
9 sides	Nonagon
10 sides	Decagon

Polygon angle facts	
Sum of interior angles in a polygon with n sides = (n – 2) × 180	
Sum of exterior angles in a polygon = 360°	
Interior angle + exterior angle = 180°	

Key facts to memorise- basic angle facts

Basic angle facts	
Angles around a point add up to 360°	
Angles on a straight line add up to 180°	
Vertically opposite angles are equal	
Angles in a triangle add up to 180°	
Angles in a quadrilateral add up to 360°	
Base angles in an isosceles triangle are equal	
Angles in an equilateral triangle are all 60°	
The exterior angle of a triangle is equal to the sum of the two opposite interior angles	

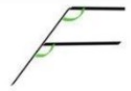
Learning objectives knowledge structure



Historical importance

300 BC	Greek mathematician **Euclid** writes a collection of 13 books called ***The Elements***. These introduce and **prove angle facts** and important ideas in **number theory**. Starting from just **7** basic assumptions (**axioms**), Euclid proved all the angle facts we still use today. Most mathematicians say **The Elements** is the **most important** maths book ever written. It introduced the idea of using **logic** to **prove theorems** in maths.
250 BC	**Archimedes** used **Pythagoras' Theorem** in polygons to find **upper** and **lower bounds** for the value of **Pi**. He first imagined a circle **inscribed** by a **regular polygon** (vertices touching the circumference of the circle). He then imagined the same circle **circumscribed** by a **regular polygon** (midpoints of sides touching the circumference of the circle). By calculating the **areas** of the **polygons** and knowing the **area** of the **circle** was between these values he could find **upper** and **lower bounds** for the value of **Pi**.

Key facts to memorise- angles in parallel facts

Angles in parallel lines facts		
		
Corresponding angles are equal	Co-interior angles add up to 180°	Alternate angles are equal

EMENY LEARNING