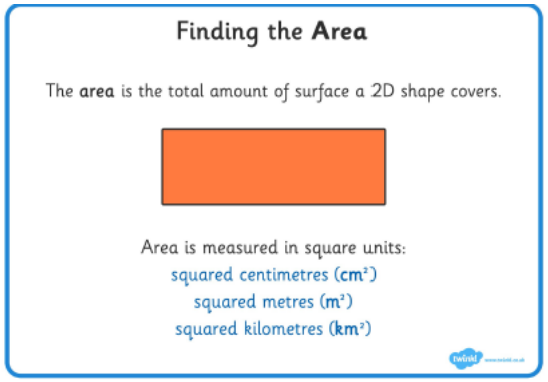
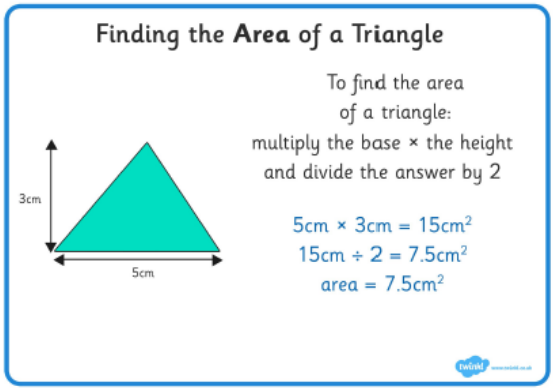
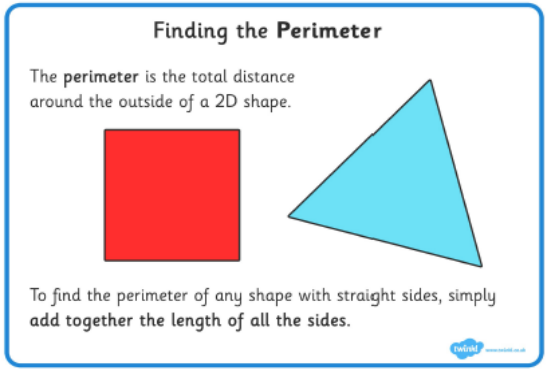
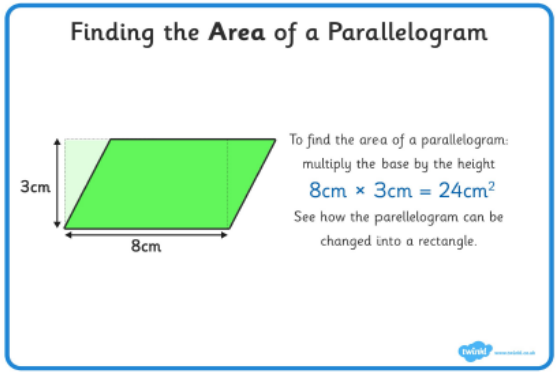
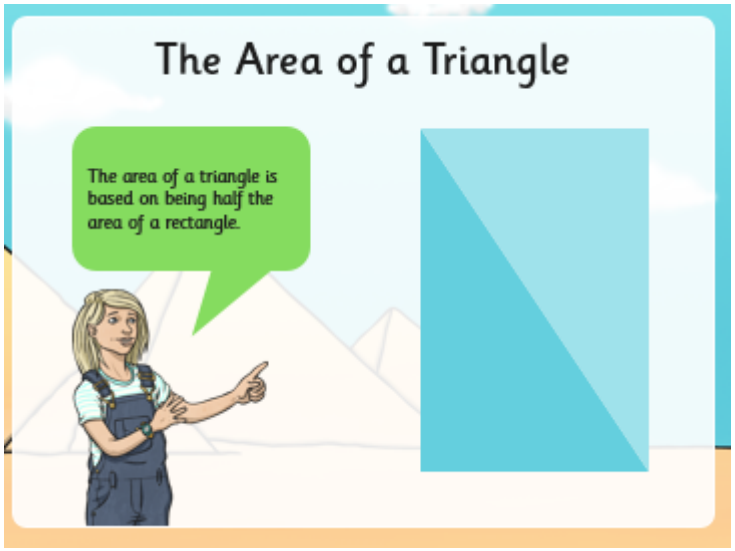
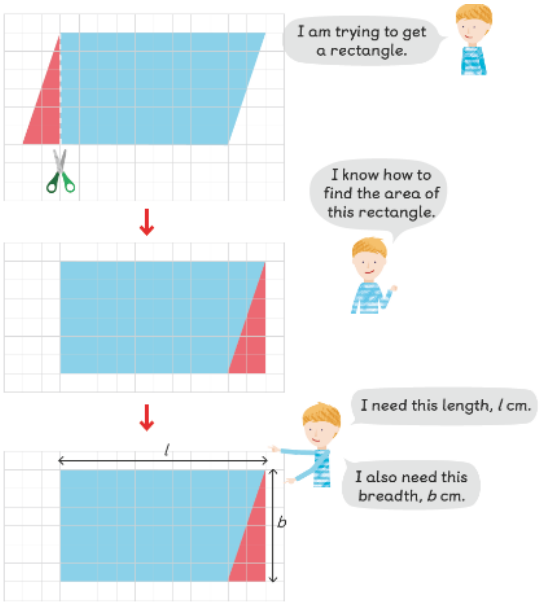
Spring 2,2018 - Maths No Problem: Year 6 **Knowledge Organiser**

Algebra

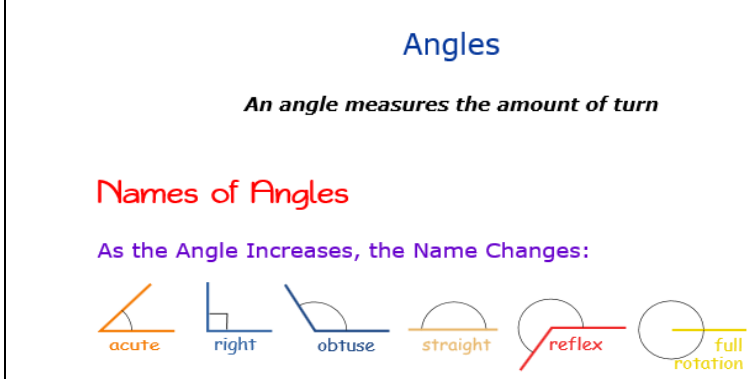
NC Link	Generate and describe linear number sequences. Express missing number problems algebraically. Use simple formulae. Enumerate possibilities of combinations of two variables. Find pairs of numbers that satisfy an equation with two unknowns.
Important Vocabulary	Pattern, sequence, formulae, algebra, equation, variables.
Key facts to memorise	**A Puzzle** What is the missing number? □ − 2 = 4 OK, the answer is 6, right? Because **6 − 2 = 4**. Easy stuff. Well, in Algebra we don't use blank boxes, we use a **letter** (usually an x or y, but any letter is fine). So we write: *x* − 2 = 4 It is really that simple. The letter (in this case an x) just means "we don't know this yet", and is often called the **unknown** or the **variable**. And when we solve it we write: *x* = 6
	Work out what number the shape represents in each calculation: a) ▼ ÷ 3 = 12 ÷ 2 ▼ = 18 **Writing Algebra** Write the algebraic expression for each of these explanations: a) p is 4 more than y — p = y + 4 b) z is twice k — 2k = z c) d is half of r — d = r ÷ 2
Strategies	**How to Solve** Algebra is just like a puzzle where we start with something like "x − 2 = 4" and we want to end up with something like "x = 6". But instead of saying "*obviously* x=6", use this neat step-by-step approach: • Work out **what to remove** to get "x = ..." • Remove it by **doing the opposite** (adding is the opposite of subtracting) • Do that to **both sides** Here is an example: We want to remove the "−2": x −2 = 4 To remove it, **do the opposite**, in this case add 2: x −2 = 4 / +2 / 0 Do it to **both sides**: x −2 = 4 / +2 +2 / 0 6 Which is ...: x +0 = 6 ***Solved!***: x = 6
	***x* + 5 = 12** What we want is an answer like "x = ...", but the **+5** is in the way of that! We can cancel out the **+5** with a **−5** (because 5−5=0) So, let us have a go at subtracting 5 from **both sides**: x + 5 −5 = 12 −5 A little arithmetic (5−5 = 0 and 12−5 = 7) becomes: x + 0 = 7 Which is just: **x = 7**

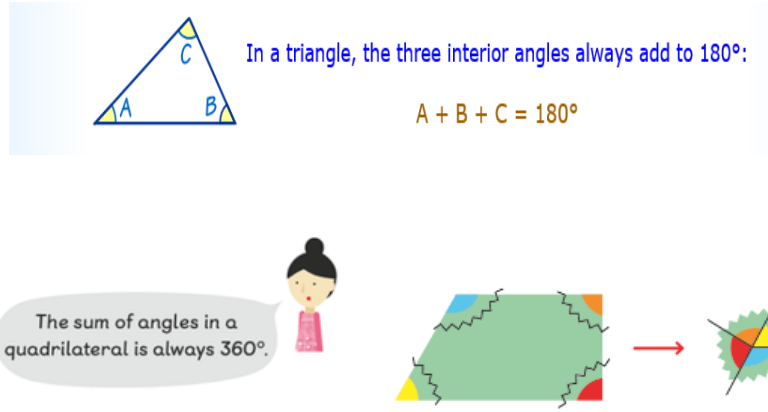
Spring 2 2018 - Maths No Problem: Year 6 **Knowledge Organiser**

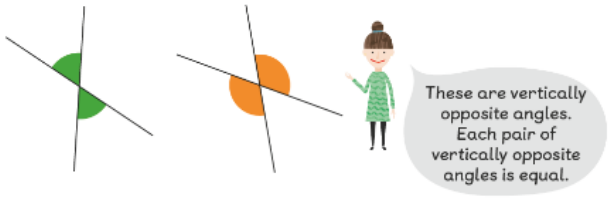
<table>
<tr><th colspan="3">Measurement – Area and Perimeter</th></tr>
<tr><td>NC Link</td><td colspan="2">Calculate the area of parallelograms and triangles. Recognise that shapes with the same areas can have different perimeters and vice versa. Recognise when it is possible to use formulae for area and volume of shapes.</td></tr>
<tr><td>Important Vocabulary</td><td colspan="2">Area, perimeter, formula(e), parallelogram, triangle,</td></tr>
<tr><td rowspan="2">Key facts to memorise</td><td> 
</td><td> 
</td></tr>
<tr><td> 
</td><td> 
</td></tr>
</table>

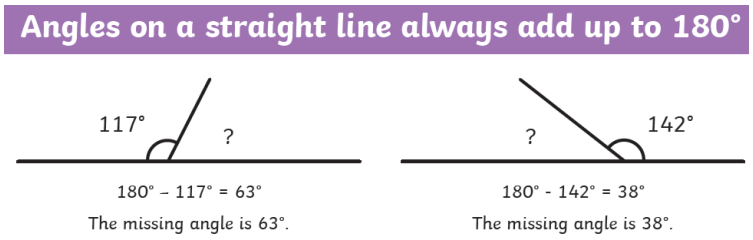
Strategies		 The area of the parallelogram is equal to the area of the rectangle.

Spring 2 2018 - Maths No Problem: Year 6 **Knowledge Organiser**

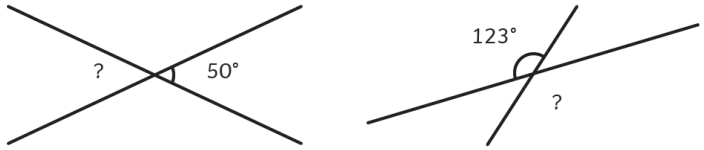
<table>
<tr><th colspan="3">Geometry – Properties and Shapes</th></tr>
<tr><td>NC Link</td><td colspan="2">Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.</td></tr>
<tr><td>Important Vocabulary</td><td colspan="2">Angles, vertically opposite angles, internal angle, polygon, geometry, triangle, quadrilateral</td></tr>
<tr><td rowspan="2">Key facts to memorise</td><td>


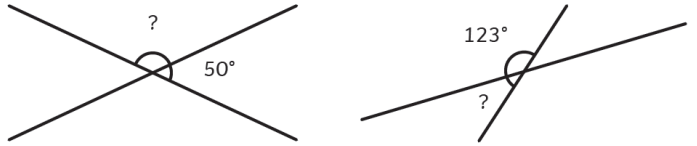
</td><td>


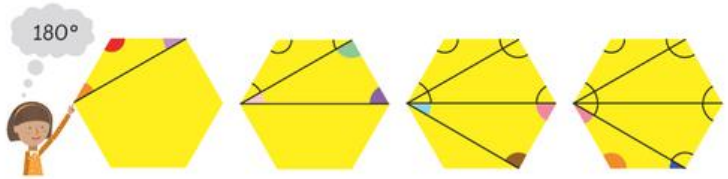
</td></tr>
<tr><td>


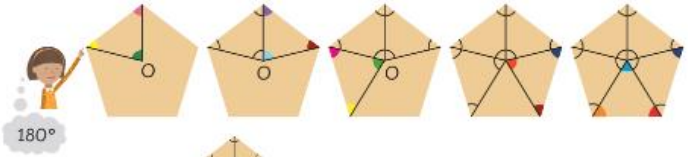
</td><td>


</td></tr>
</table>

<table>
<tr>
<td></td>
<td>
Missing Vertically Opposite Angles
Opposite angles are equal.


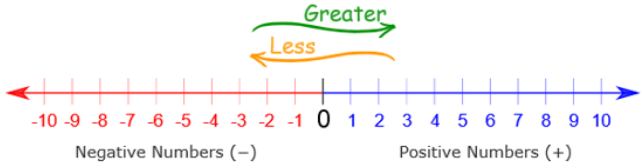
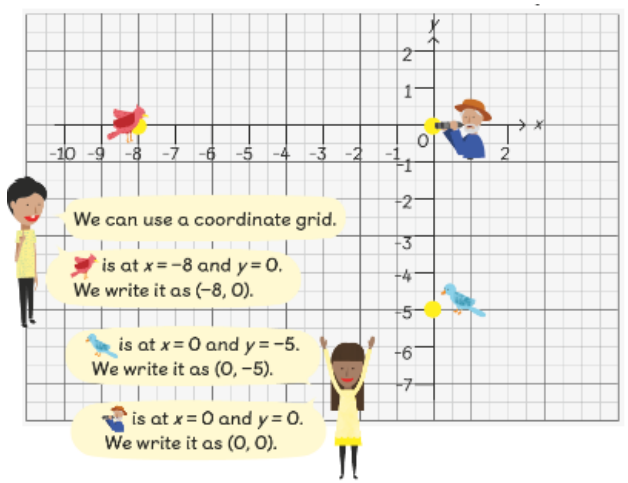
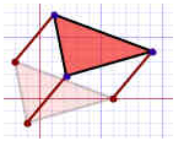
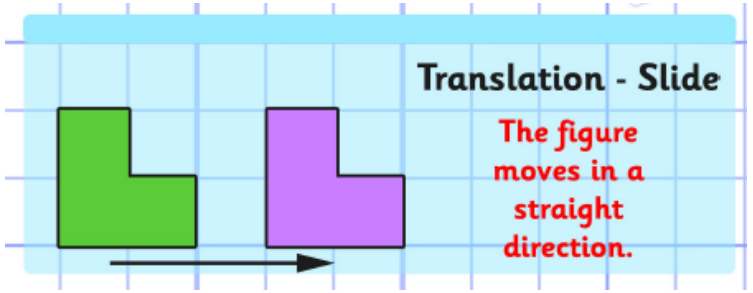
The missing angle is 50°.
The missing angle is 123°.
</td>
<td>
Angles around a point total 360°


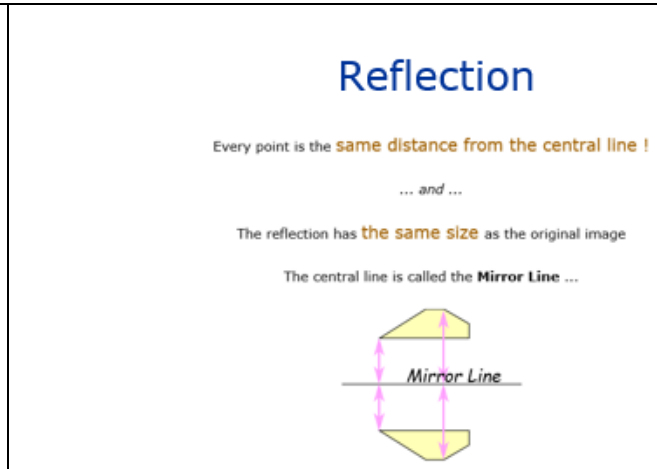
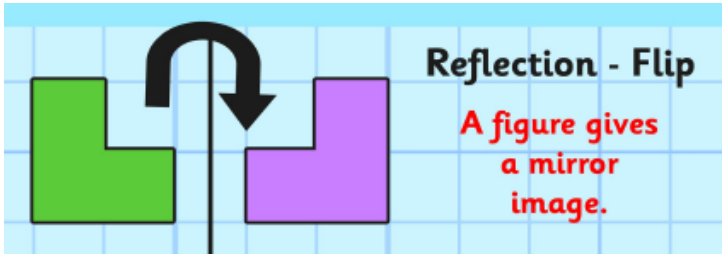
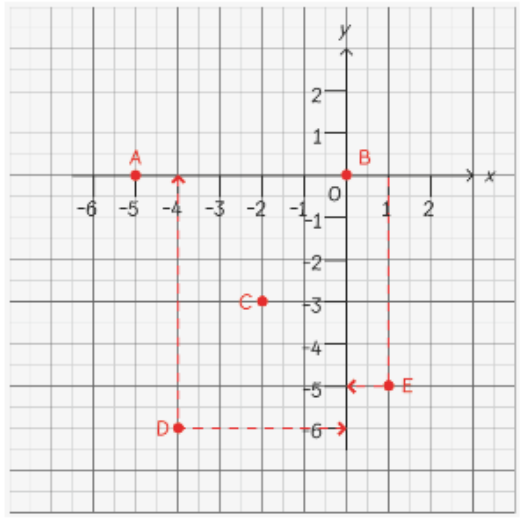
The two known opposite angles total 100°.
360° - 100° = 260°
260° ÷ 2 = 130°
The missing angle is 130°.
The two known opposite angles total 246°.
360° - 246° = 114°
114° ÷ 2 = 57°
The missing angle is 57°.
</td>
</tr>
<tr>
<td>Strategies</td>
<td>


The 6 angles of the hexagon make up the angles of 4 triangles.
So the sum of these 6 angles is equal to 4 × 180°.
</td>
<td>


The angles of the  make up 5 triangles.
So the sum of the 5 angles of the pentagon + 360° = 5 × 180°.
</td>
</tr>
</table>

Spring 2 2018 - Maths No Problem: Year 6 **Knowledge Organiser**

Geometry – Position and Movement		
NC Link	Use negative numbers in context, and calculate intervals across zero. Describe positions on the full coordinate grid (all four quadrants). Draw and translate simple shapes on the coordinate plane. Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.	
Important Vocabulary	Translation, reflection, coordinate grid, coordinate plane (grid), quadrants	
Key facts to memorise	 	In Geometry, "Translation" simply means **Moving** … … without rotating, resizing or anything else, **just moving.** To Translate a shape: Every point of the shape must move: • the **same distance** • in the **same direction.**  

		
Strategies	 D is then at $x = -4$ and $y = -6$. D is at $(-4, -6)$. E is at $x = 1$ and $y = -5$. E is at $(1, -5)$.