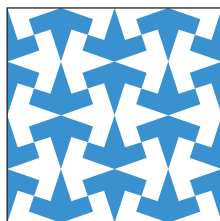


As outcomes, Year 8 pupils should, for example:

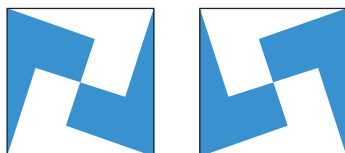
Use angle and side properties of triangles, and angle properties of parallel and intersecting lines, to solve problems. Explain reasoning. For example:

- Use alternate and corresponding angles to explain why any scalene triangle will tessellate.
- This tiling pattern can be found in the Alhambra Palace in Granada, Spain.



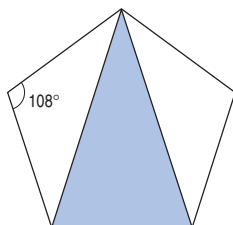
How would you describe the pattern over the telephone to someone who has never seen it?

The pattern can be made by using these two tiles.



Suggest how to construct them. What other patterns can you make with these two tiles? Reproduce the tiling pattern using **computer tiling software**.

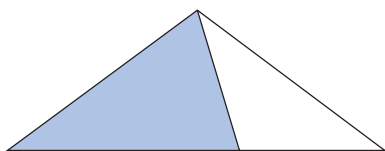
- The angle at the vertex of a regular pentagon is 108° .



Two diagonals are drawn to the same vertex to make three triangles.

Calculate the sizes of the angles in each triangle.

The middle triangle and one of the other triangles are placed together like this.



Explain why the triangles fit together to make a new triangle. What are its angles?

Link to problems involving shape and space (pages 14–17).

As outcomes, Year 9 pupils should, for example:

Understand and recall Pythagoras' theorem:

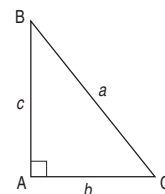
- as a property of areas: in a right-angled triangle, the area of the square on the hypotenuse is equal to the sum of the areas of the squares on the other two sides.

- as a property of lengths:

$$a^2 = b^2 + c^2$$

Appreciate that:

- If $a^2 > b^2 + c^2$, then A is an obtuse angle.
- If $a^2 < b^2 + c^2$, then A is an acute angle.

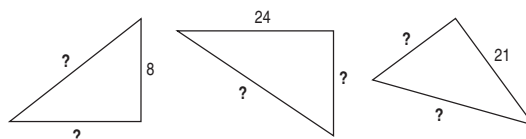


Know the Pythagorean triples (3, 4, 5) and (5, 12, 13). Explore others using a **spreadsheet** or **calculator**. Recognise that multiples of a Pythagorean triple are also Pythagorean triples and produce similar triangles.

Link to problem solving – ‘Hexagons’ (pages 34–5), algebra (pages 120–1), trigonometry (pages 242–7), and coordinates (pages 218–19).

Use Pythagoras' theorem to solve simple problems in two dimensions. For example:

- You walk due north for 5 miles, then due east for 3 miles. What is the shortest distance you are from your starting point?
- A 5 m ladder leans against a wall with its foot 1.5m away from the wall. How far up the wall does the ladder reach?
- The sides of some triangles are:
 - 5, 12, 13
 - 6, 7, 8
 - 5, 8, 11
 - 16, 30, 34
 - 13, 15, 23
 Without drawing the triangles, classify them according to whether they are acute-angled, right-angled or obtuse-angled.
- Find whole-number lengths that will satisfy these right-angled triangles. There may be more than one answer.



Link to problems involving shape and space (pages 14–17).