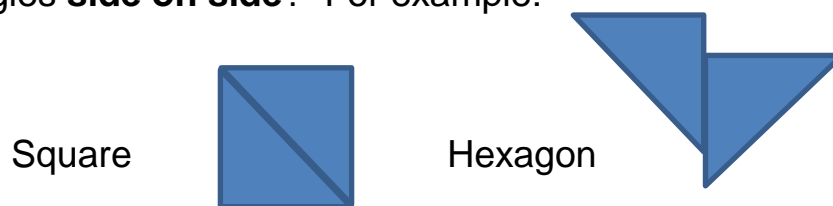


Shape Week – Geometric Reasoning Y5/6

You will need A4 paper each day (it can be scrap paper), a pair of scissors, a pencil and a ruler.

Day 1

- Follow the video to make a 21 cm square from a sheet of A4 paper. https://www.youtube.com/watch?v=9r8QQUPkP_g
- Cut along the diagonal fold line to make two triangles.
- What do you notice about the triangles? How big are the angles? How do you know?
- How many different polygons can you make by lining up the triangles **side on side**? For example:



- Can you make a pentagon? Can you make an octagon? What else can you make?
- Photograph and draw each polygon you make. Label the shapes including the lengths of the sides and the sizes of the angles. What do you notice?
- How do you know when you have found all the possible polygons?

Notes for adults working with groups of children

- Help the children to work and record systematically so that they can be sure they've found all possibilities. Are they going to draw around the shapes or sketch them?
- Encourage the children to describe, explain and reason, for example ask: Why will an irregular hexagon be the largest polygon you can find? How do you know the size of the angles in each shape?

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Shape Week – Geometric Reasoning Y5/6

Day 2

- Use your triangles from day 1 and create another pair the same way so that you have four identical triangles.
- How many different polygons can you make by fitting the four triangles together? You may only fit long sides to long sides and short sides to short sides and the whole length of the sides must be joined. For example:



Parallelogram

- Photograph and draw each polygon you make. Label the shapes including the lengths of the sides and the sizes of the angles. What do you notice?
- How do you know when you have found all the possible shapes?

Notes for adults working with groups of children

- Help the children to work and record systematically so that they can be sure they've found all possibilities. Are they going to draw around the shapes or sketch them? How will they work out the angles for each shape?
- When the children have explored this they could look at other children's solutions on the Nrich website <https://nrich.maths.org/141/solution>

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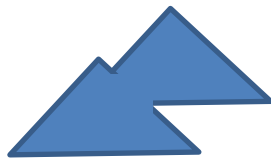
Shape Week – Geometric Reasoning Y5/6

Day 3

- Use two of your triangles from day 2.
- What different polygons can you make by overlapping the two triangles?

Consider the shapes made by the two triangles together, for example

heptagon



and the shapes made where the triangles overlap, for example

triangle



- Can you make a pentagon? Can you make an octagon? What else can you make?
- Photograph and draw each polygon you make. Label the shapes including the lengths of the sides and the sizes of the angles. What do you notice?
- How do you know when you have found all the possible shapes?

Notes for adults working with groups of children

- Help the children to work and record systematically so that they can be sure they've found all possibilities. Are they going to draw around the shapes or sketch them? How do they know the sizes of the angles in each shape?
- Encourage the children to describe, explain and reason and to look up the names of shapes they don't know online.

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Shape Week – Geometric Reasoning Y5/6

Day 4

- Make two 21 cm squares like you did on day 1.
- What different polygons can you make by overlapping the two squares?

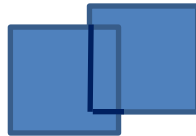
Consider the shapes made by the two squares together, for example

octagon



and the shapes made where the squares overlap, for example

rectangle



- Can you make a pentagon? Can you make a heptagon? What else can you make?
- Photograph and draw each polygon you make. Label the shapes including the lengths of the sides and the sizes of the angles. What do you notice?
- How do you know when you have found all the possible shapes?

Notes for adults working with groups of children

- Help the children to work and record systematically so that they can be sure they've found all possibilities. Are they going to draw around the shapes or sketch them? How do they know the sizes of the angles in each shape?
- Encourage the children to describe, explain and reason and to look up the names of shapes they don't know online.

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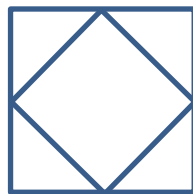
Shape Week – Geometric Reasoning Y5/6

Day 5

- Make a 21 cm square like you did on day 1.
- Fold your square in half to make a rectangle, then in half again to make a smaller square. Open your paper out. Now fold diagonally corner to corner to make one diagonal fold line and repeat for the other diagonal. You should now have four fold lines that all go through the centre of the square. You will use these fold lines during the activity.



- Mark halfway along each side using your fold lines and use a ruler to join up the four points as below:



- What do you notice? What shapes can you see?
- Now mark halfway along each side of the smaller square using the fold lines. Use a ruler to join up the four points. What do you notice? What shapes can you see now?
- Repeat as many times as you can. What do you notice about the number and size of the triangles each time? What do you notice about the area of each new square? What do you notice about the area of the triangles? What other patterns can you see?
- Use coloured pens or pencils to create a design on your square.

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