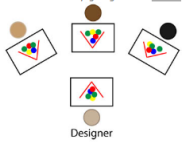
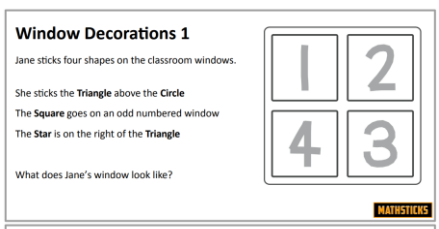
Planning Overview
Year 2 Geometry Position and Direction

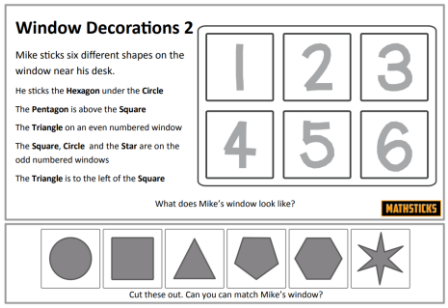
Order and arrange combinations of mathematical objects in patterns and sequences
Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).

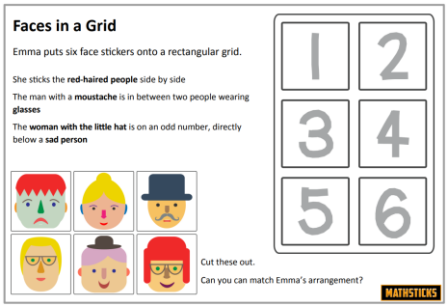
Make links to Geography National Curriculum - use simple compass directions (North, South, East and West) and locational and directional language [for example, near and far; left and right], to describe the location of features and routes on a map.

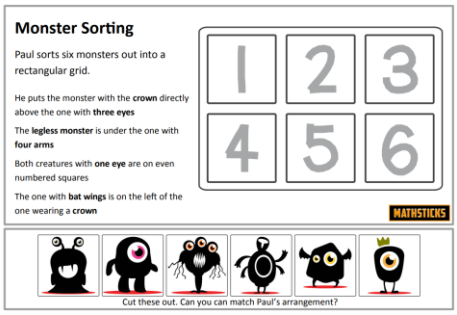
	Teaching and Learning
Describe position (in, on, under, in front of, behind, in between, next to, on the left of, on the right of, above, below)	Use a selecion of objects that allow children to put a toy in, on and under each one e.g. use a toy, a chair, a cushion and a bucket so that cushion and cuddly toy can fit in the bucket but also lie across it so they are on it. The bucket should also fit under and on the chair. Recap language of position from EYFS/Year 1 (in, on, under, next to, in front of, behind, between, on the left of, on the right of). Give children photos (2D representation) of a set of objects in a certain arrangement – can one child describe the arrangement in the photo? Can the other children recreate it following their description? Play barrier games that link to work on 2D and 3D shapes e.g. using a compare bear and a variety of 3D shapes to arrange around it. NRICH – en-counters expands this idea to a group activity to promote teamwork. **En-counters** Age 5 to 7 Challenge Level ★ This is one of a series of problems designed to develop learners' team working skills. Other tasks in the series can be found by going to this article.  Designer **What are you aiming to do?** **For the task:** Learners must complete the task themselves but with support and advice from other members of the team. Solve problems that use the language of position on a 2D grid

Mathsticks – logical thinking with pictures

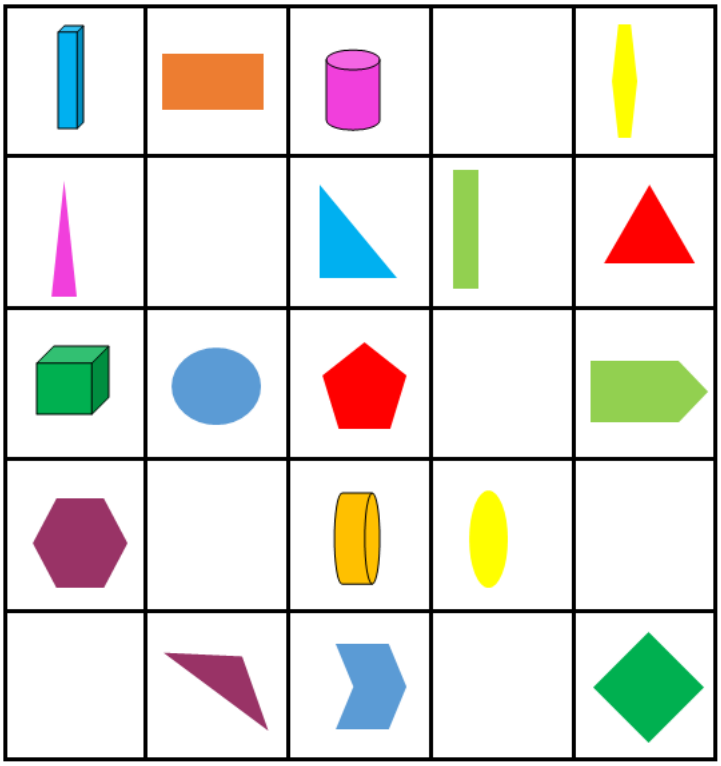




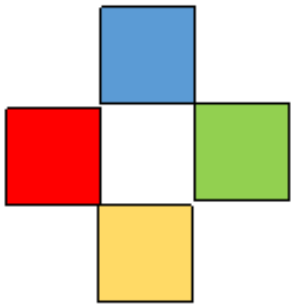


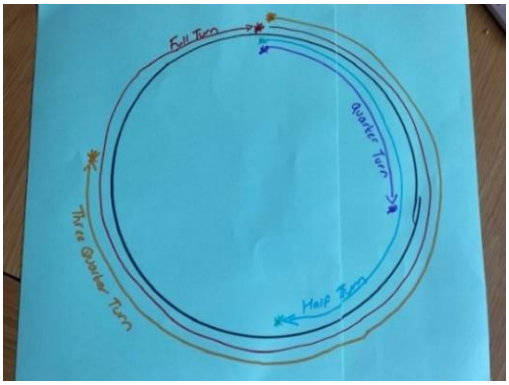
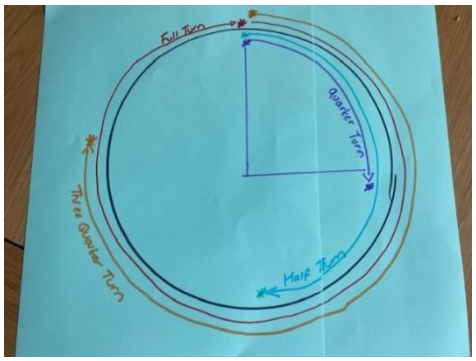


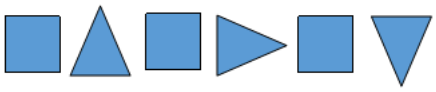
Make sure children understand the terms row and column and can combine these with ordinal numbers to identify a specific row or column e.g. it is the 3rd shape from the left on the middle row?



Think of a shape and give your partner a description of where it is using row, column and first second third from top or bottom, right or left. Can they identify your shape?

Describe direction and movement without turns (forwards, backwards, left, right, up, down)	Recap giving and following instructions to move yourself or a partner forwards, backwards, left and right on a large scale grid or complete activities where you need to colour in a route following a set of written directions or write the set of directions for a given shaded route. Extend to maybe introduce the compass points and terms North, South, East and West in a cross-curricular activity with Geography. Use an aerial photo of the school grounds with a grid overlay. Write directions to get from one area of the school to another.
Describe rotation as turns (whole, half quarter and three quarter turns clockwise and anti-clockwise)	Children have learnt about quarter, half and three quarter turns in Year 1 but have not used the terms clockwise or anti clockwise yet. Use this song to recap the vocab and introduce those new terms.  https://www.bbc.co.uk/teach/supermovers/ks1-maths-position-&-direction/zhh9scw  Progress from children turning themselves to turning a character in the middle of a grid like this. Which colour will the character be facing after a quarter turn anti-clockwise? Move onto rotating flat objects e.g. a numicon plate or an arrow Recognise how far the shape has turned and in which direction – quarter turn, half turn or three-quarter turn? Clockwise or anti-clockwise?  Draw pictures after a certain turn has been made. Recognise the equivalence of a quarter turn clockwise and three quarter turn anti-clockwise. Can children work backwards and identify the starting point if they know which turn a shape has gone through e.g. What was the starting point for this numicon plate if it has done a three quarter turn anticlockwise and ended up in this position?

Describe rotation in terms of right angles	Use a hula hoop to chalk a large circle on the playground for each child to stand in. In one colour chalk draw a line around the outside of the circle to shaw them turning a full turn. Change colour and chalk a line to shaw a half turn around the circle. Repeat in a third colour for quarter turn and a fourth colour for three quarter turns making sure you always start at the same place and put a mark to show the start and end points for each turn.  Ask children to look carefully at the quarter turn line. Ask them to draw a straight line from their start position to the middle of the circle and a straight line form their end position to the middle of the circle. Can they decribe what they have made – some childen might talk about this as looking like the veritces of a square or some might talk about it as being a L shape.  Introduce the term right angle. Ask the children if they turned 2 of those right angles what would they have turned? How about 3? How about 4? Ask children to turn 2 right angles, 3 right angles/ do some children end up facing different directions? Why is this the case? Make the link to clockwise and anticlockwise.
Describe direction and movement including using a range of vocabulary to describe turns	Chalk out a grid on the playground. Give and follow instructions to move yourself or a partner around the grid. E.g. move forwards 2 spaces, turn clockwise one quarter turn, move forwards 3 spaces, turn 2 right angles to the right. Use a programmable toy like beebot or roamer to move around a floormat collecting items using forwards, backwards and programming turns. Devise a way to record your route. Make cross-curricular links to coding activities in Computing. Look at given start and end positions. What route might the beebot/roamer have taken? Record the route use directional language with turns described using both types of language.

Order and arrange combinations of mathematical objects in patterns and sequences	Recap repeating patterns with shapes from EYFS/Y1. Children should be familiar with patterns beyond simple AB patterns e.g. ABC, ABBC, ABAD etc. already. Use pattern blocks to create patterns where direction or turns are the element that is changing. Can children continue or copy the pattern? Can they work out the pattern rule (smallest unit of repeat)? Can they create their own patterns which include rotations? Draw shapes that continue this type of pattern.  **Mastery** Fill in the missing shape to complete the pattern.  Explain your reasoning. **Mastery with Greater Depth** Fill in the missing shape to complete the pattern.  If the pattern continued what would the tenth shape be? Explain your reasoning. Encourage more open-ended pattern making using NRich Polyplug pattern or problem solving around patterns with NRich School Fair necklaces.