FS2 Personalised Maths Learning Journey - Shape

Development Matters:

- To know the names of 2D shapes.
- To know that 2D shapes can have sides and corners.
- To know the names of some 3D shapes.
- To know that 3D shapes have faces, vertices and edges.
- To know that 3D shapes can have faces, vertices and edges.
- To select, rotate and manipulate shapes in order to develop spatial reasoning skills
- To compare and decompose shapes – recognition that a shape can have shapes within it (like a number).

Resources/documents:

FS Progression maps, Development Matters, White Rose schemes of work.

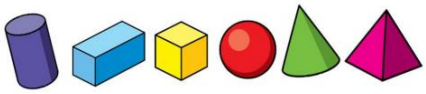
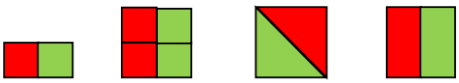
Real 2D and 3D shapes, 2D and 3D shape resources, construction resources

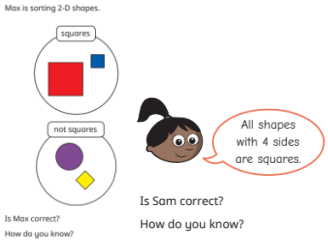
Real life discussion before teaching:

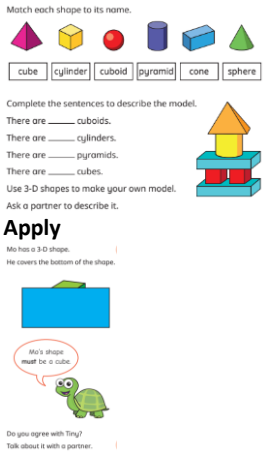
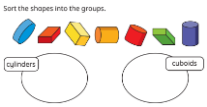
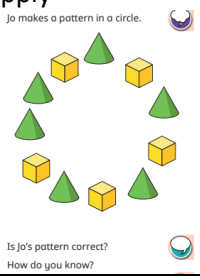
Relating to current topics and interests. Continuous provision will be carefully planned to practise new skills being taught, and to consolidate previous learning.

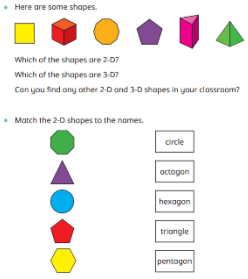
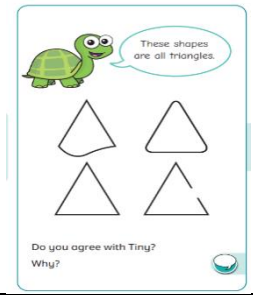
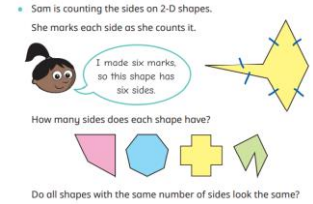
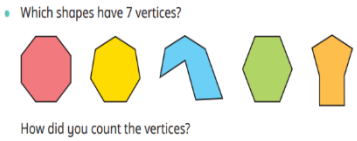
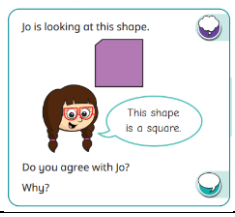
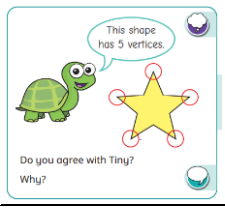
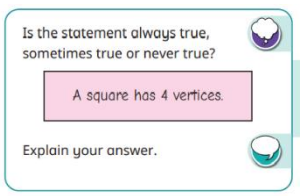
Pre- assessment	Assessment tasks
Previous learning can be seen on the mathematics progression map.	Mini – quizzes Plenaries Interactions with children in provision Observations of children in provision Questioning during learning time Assessments half termly – knowledge focused on for the half term

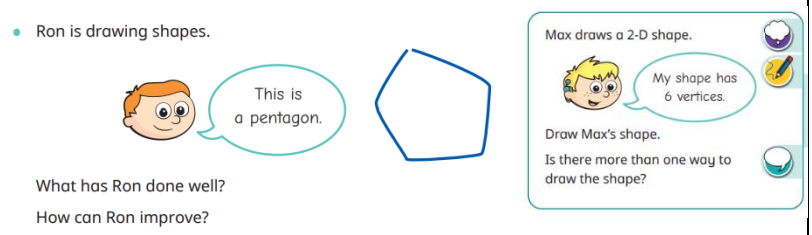
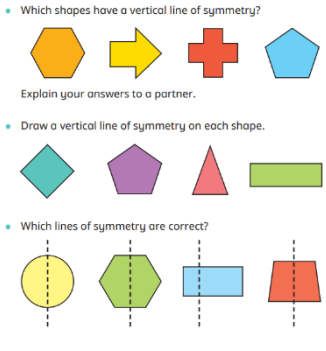
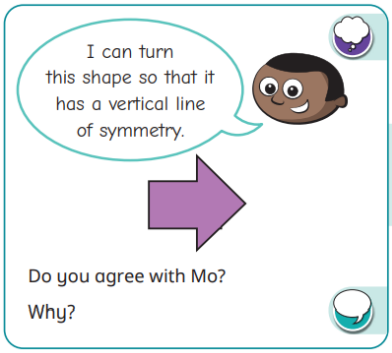
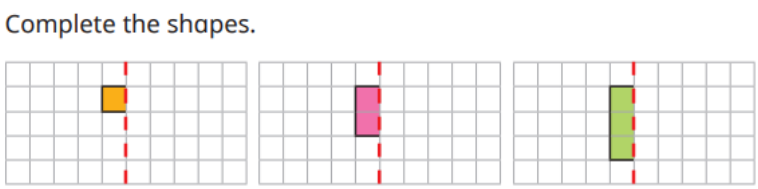
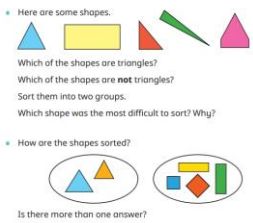
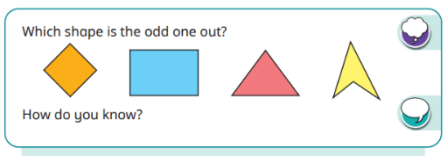
Teaching sequence	Learning tasks	Language Focus
WALT: know the names of 2D shapes.	**Behind the wall** Use a puppet to slide a shape slowly up out of the box. *What shape is (s)he hiding behind the wall?* Children guess what shape it might be, and also discuss what it can't be. Reveal a little more. Have they changed their minds? Reveal the whole shape, were they correct? **Shape monster** Collaborate to make one BIG 'monster' out of gummed shapes, discussing the shapes you are using as you do so. Afterwards, challenge children to count how many squares are in the picture, then rectangles, triangles and circles. **Guess my shape** Hide a flat shape (square, rectangle, circle or triangle) in a feely bag and ask a child to describe it to the rest of the group. **Shape hunt** Hunt for shapes in the environment	Square, circle triangle, rectangle
WALT: To know that 2D shapes can have sides and corners.	**Pipe cleaner challenge** Challenge children to make as many different shapes from pipe cleaners as they can. Each shape is made using one pipe cleaner. How many shapes can they name? *How many times will you bend it to make a square? What do you need to do if you want to make a triangle?* **Ropey shapes** Use chalk to draw large 2-D shapes on the playground. Children decide how many ropes are needed to make each shape. (a rope for each side)	Square, circle triangle, rectangle, sides, corners

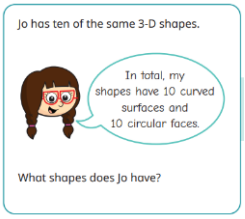
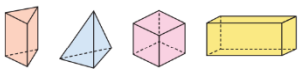
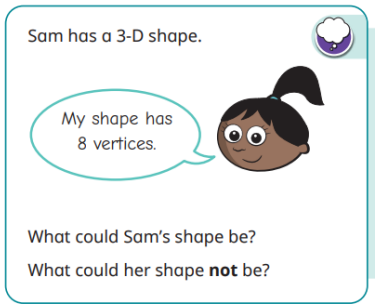
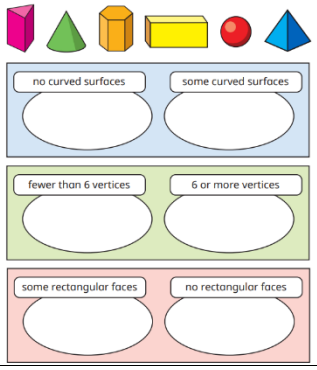
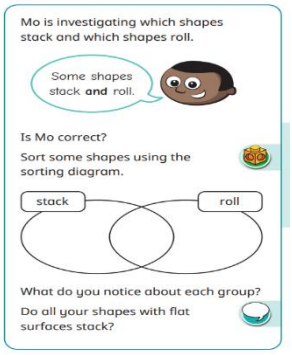
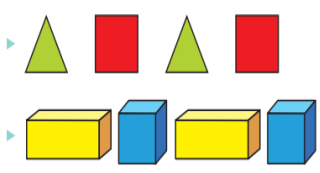
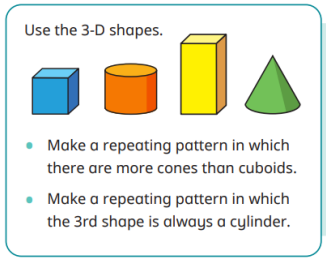
WALT: know the names of basic 3D shapes	**Box Nets** Give a selection of packets to pairs of children. They look at the 3-D shapes and then think what 2-D shapes they might see on the flattened packet. They cut open the packets carefully along their edges. They label the 2-D shapes they see and discuss the layout of the flattened packet.	Cube, cuboid, sphere, pyramid
WALT: select, rotate and manipulate shapes in order to develop spatial reasoning skills	**Match the shape** Children find the matching shape – changing orientation from the norm. 	Square, circle triangle, rectangle, sides, corners, rotate, turn
WALT: know that 3D shapes have faces, vertices and edges.	**Show me shapes** Show the children a collection of 3-D shapes. Choose any of the shapes and ask children to tell their partner as many things they can about the shape. Can they find another shape like it? A different shape? How are they the same or different?  **Matching shapes to faces** Hold up a 3-D shape to the group, e.g. cube. Turn it so that the children can see each face. They hold up their 2-D shape if they can see it as a face on your 3-D shape. Can they name the 3-D shape? Repeat, holding up a pyramid, cuboid, cone and cylinder. Explain that sometimes children might need to hold up more than one 2-D shape. **Sorting shapes** Give each child a 3-D shape: include some with flat faces, some with curved faces and some with both curved and flat faces. Lay two hoops overlapping on the floor. Label one 'curved faces', one 'flat faces', with the overlap between the hoops labelled 'curved and flat faces'. Children place their shapes in the correct hoop. **Hidden shapes** Hide a 3-D shape in a bag and begin to describe it to the children. Each pair holds up the shape they think is the same type as the one you've hidden (though it might be a different size). Reveal the shape to check.	Cube, cuboid, sphere, pyramid, cylinder, cone, faces, vertices, edges
WALT: compare and decompose shapes – recognition that a shape can have shapes within it (like a number).	Ask the children to investigate which shapes they can make by combining squares, rectangles and triangles in different ways 	Square, circle triangle, rectangle, sides, corners

Y1 Personalised Learning Journey Date: WB:		
NC Objective: Geometry – shape		
Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs. Natural objects, 2d + 3d shapes, every day objects		
Pre- assessment	Assessment tasks	Language Focus
Teaching sequence	Learning tasks	Language Focus
1. WALT: Recognise and name 2D shapes	**WILF:** I can name, label and recognise a range of 2D shapes. Label shapes / match shapes to their names Shapes in real life Shapes in real life images – what shapes can you see? Draw pictures with x amount of squares, triangles etc. Create shapes using natural objects (twigs etc.) practical learning Apply  ”x says it could be a triangle” do you agree? GD 	Square Triangle Rectangle Circle Oval Semi-circle
2. WALT: Sort 2D shapes	**WILF:** I can sort a range of 2D shapes into groups and explain those groups. Sort 2D shapes into given groups Give own groupings to given shapes Show groups- how have they been sorted? Apply 	Square Triangle Rectangle Circle Oval Semi-circle Groups Sort
3.	**WILF:** I can name and recognise a range of 3D shapes.	Shape 3D

WALT: Recognise and name 3D shapes	Explore real life 3D shapes – look at a selection. Find 3D shapes in real life **Evidence**:  **Apply** 	2D Cube Cylinder Cuboid Sphere Cone Pyramid
4. WALT: Sort 3D shapes	**WILF:** I can sort a selection of 3D shapes into groups and justify their groups. **EVIDENCE:**  (and other examples) **Apply** Odd one out **GD**: Shapes that can be sorted in more than one way.	3D Shapes Groups Sort Cube Cylinder Cuboid Sphere Cone Pyramid Roll Stack Sides Flat Curved Round
5. WALT: Create and continue patterns with 2D and 3D shapes	**WILF**: I can use 2D and 3D shapes to make patterns and carry on incomplete patterns 1. Say aloud patterns of 2d shapes 2. Continue patterns of 2d shapes 3. Continue patterns of 3d shapes 4. Continue patterns of 2d + 3d shapes 5. Create own pattern of 2d shapes 6. Create own pattern of 3d shapes 7. Create own pattern of 2d + 3d shapes Apply  	Pattern Shapes 2D 3D

Y2 Personalised Learning Journey Shape		
NC Objective: • Recognise and name common 2-D and 3-D shapes, including: • 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres].		
Resources/documents: White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, Garry Hall.org.uk		
Real life discussion before teaching: Brainstorm where we see shapes in everyday life. (road signs, building materials, school environment)		
Pre-assessment	Assessment tasks	Language Focus
	Name and sort 2D and 3D shapes	
Teaching sequence	Learning tasks	
WALT: Recognise 2D and 3D shapes	Children need to recognise and name both 2-D and 3-D shapes and differentiate between them. Let ch see and feel the shapes. They should begin to understand that 2-D shapes are flat and that the manipulatives they handle in class are representations of the shapes. Children should be able to recognise both standard and non-standard representations of 2-D and 3-D shapes. For example, they should notice that there is no such thing as an 'upside down triangle'; instead, it is just a triangle in a different orientation.  	What is the difference between a 2-D and a 3-D shape? What is the name of this shape? How do you know? Does a always look the same? Can you think of some examples? What 2-D shapes can you see on this 3-D shape? How do you know that this shape is a ? Which shape is the odd one out? How do you know?
WALT: Count sides and vertices on 2D shapes	Teach: that the sides of a shape are the straight lines that form its outline. They should have experience of feeling models of the shapes and running their fingers along each side as they count. They may not be accurate when counting the sides, so encourage them to develop strategies such as marking sides as they count them. Children need to know that they can use the number of sides to identify the shape. They may have a standard mental image of, for example, a triangle, but should be aware that any shape with three straight sides is a triangle. Count vertices on 2-D shapes. This is the first time that children have encountered the terms "vertex" and "vertices". They should understand that a vertex is formed where two sides meet, and "vertices" is used when referring to more than one vertex.     	What is a side/vertex? How can you count the sides/vertices of a shape accurately? How many sides /vertices does a have? Does a shape with sides always look the same? Can you think of some examples? What is the name of a shape with x sides? How many triangles/squares/pentagons can you make with 15 lolly sticks?
WALT: Draw 2D shapes	Begin by using straws and modelling clay to explore how to make shapes before using dotted and squared paper to draw them using a pencil and ruler. When making shapes, children should be encouraged to consider what the straws represent (sides) and what the modelling clay represents (vertices).	How can you make the 2-D shape using straws and modelling clay? How can you change your shape to a different one? How can you accurately draw a ? How do you know you have drawn a ?

		Is there more than one way to draw a ?
WALT: find lines of symmetry on 2D shapes	Show children symmetrical pictures and ask them to think about what "symmetrical" means. They could identify that a shape is symmetrical when both sides are the same. Give them shapes that they can cut out and fold to identify the shapes that have a vertical line of symmetry. After this, they look at shapes with a mirror line drawn to help identify whether a shape has a vertical line of symmetry. They then draw their own mirror line or use mirrors to identify shapes with a vertical line of symmetry   	What does "symmetrical" mean? How do you know if a shape is symmetrical? How can you use a mirror to help you? Is the shape the same on both sides? How do you know that this shape does/does not have a vertical line of symmetry? How can you be accurate when you are drawing a vertical line of symmetry?
WALT: Sort 2D shapes	Explore similarities and differences between shapes and sort them according to what they notice. Sort and group 2-D shapes according to simple properties, including size and colour, and more formal properties, such as number of sides and vertices. Children need to sort shapes into groups as well as identify how given groups of shapes have been sorted. Encourage children to explain in detail what they notice about groups of shapes and consider whether they could have been sorted another way. Discuss how the orientation of a shape does not affect its properties. Take time to explore the similarities between squares and rectangles so that children see the connection  	How have you sorted the shapes? How do you know this shape is in the correct group? How can you use the number of sides/vertices to help you? Are there any other ways to sort the shapes? What other shape could go in this group? What shape could not go in this group?
WALT: Count faces on 3D shapes	Children first identify what a face is and develop efficient methods for counting them, for example marking on the shape or using sticky paper. They should be able to identify the 2-D shapes that make up the faces of 3-D shapes, including identifying pyramids according to the shape of their base. Children explore the difference between a face and a curved surface, describing a cylinder as having two faces and one curved surface.	What is a face? What is a curved surface? What is the difference between a face and a curved surface? How can you count the faces of a shape efficiently? What 2-D shapes can you see on this 3-D shape? What 3-D shape

	• Here are some 3-D shapes.  ▸ What is the name of each shape? ▸ How many faces does each shape have? ▸ Draw the faces of each shape. 	do you think these 2-D shapes make? How many faces does a have?
WALT: Count edges and vertices on 3D shapes	Teach what an edge is and that it is formed where two faces meet. Discuss counting strategies and think about how they may be different from counting the faces of a 3-D shape. Children should first count the edges by holding 3-D shapes before looking at images of 3-D shapes. Count vertices on a 3D shape employing efficient strategies. • How many vertices does each shape have?  How did you count them? • How many vertices does each shape have?  • How many vertices does a sphere have?  	What is an edge? How is an edge different from a face? How can you count the edges of a shape efficiently?
WALT: Sort 3D shapes	Children explore sorting shapes into a range of different groups and thinking about how some shapes have been sorted. They may notice that some shapes go into similar groups, for example a cube and a cuboid, and could think about the reasons behind this. • Sort the shapes into the correct groups.  	How can you sort these shapes? Which group does a go into? How do you know this shape is in the correct group? Which shape is the odd one out? Why do some shapes go into the same groups? Is there another way to sort these shapes?
WALT: Make patterns with 2D and 3D shapes	Identify and name shapes to help them describe the patterns accurately. They look at patterns made up of only 2-D or only 3-D shapes, before looking at patterns that are made up of both. Encourage children to not only think about the next shape in the pattern but also identify what, for example, the 10th shape would be. Discuss strategies such as drawing out the pattern or spotting connections between the position number and the shape. • Draw the next two shapes in each pattern.  What is the 10th shape in each pattern? 	What shapes can you see in the pattern? Which shapes are repeating? What would be the next shape in the pattern? What would be the shape after that? What would the 10th shape be? Is the pattern repeating or symmetrical?

Y3 Personalised Learning Journey

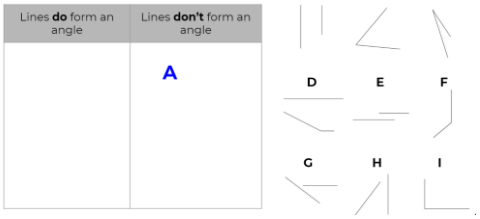
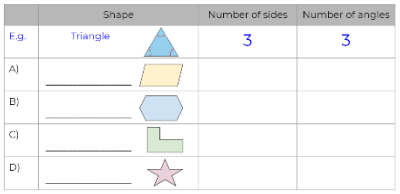
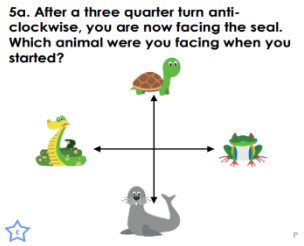
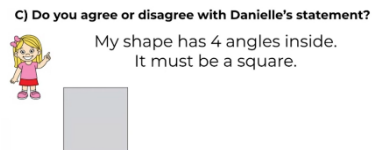
Angles and Shape

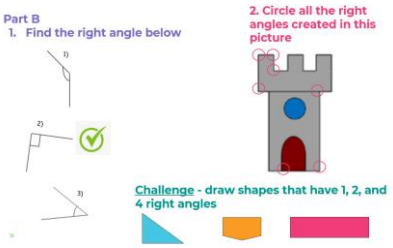
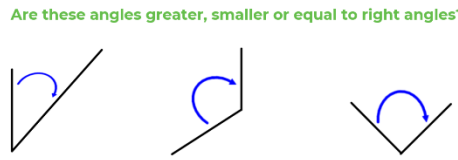
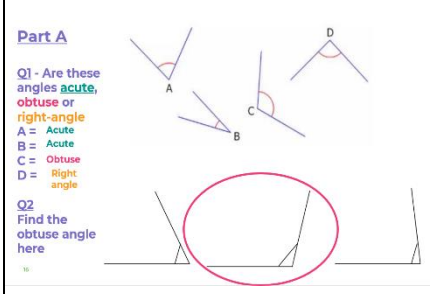
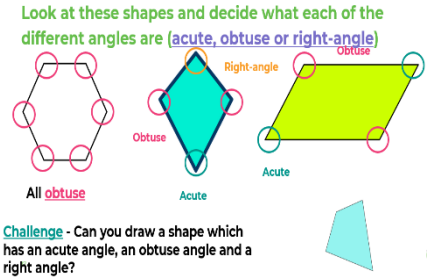
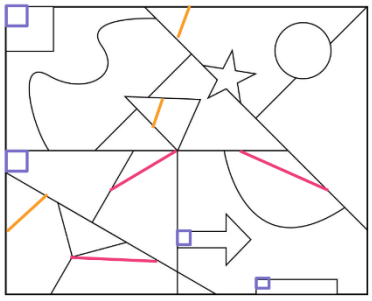
NC Objective:

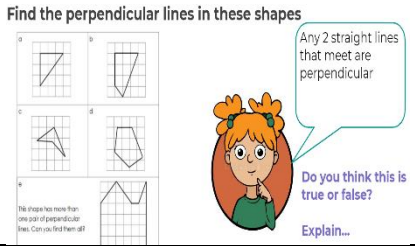
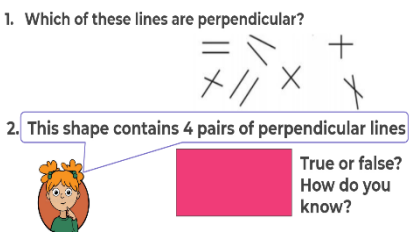
- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines

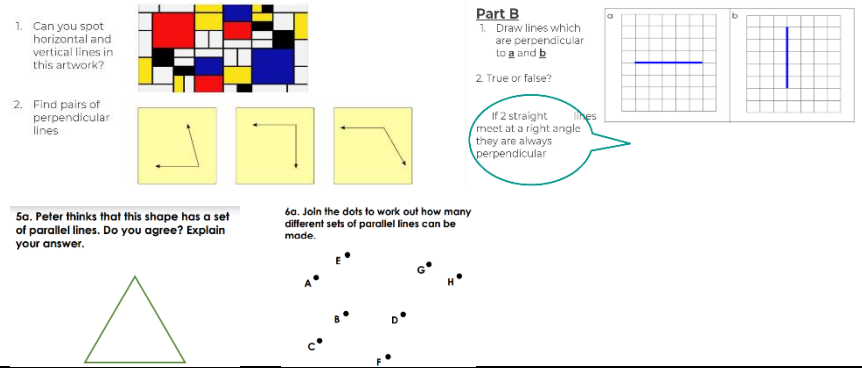
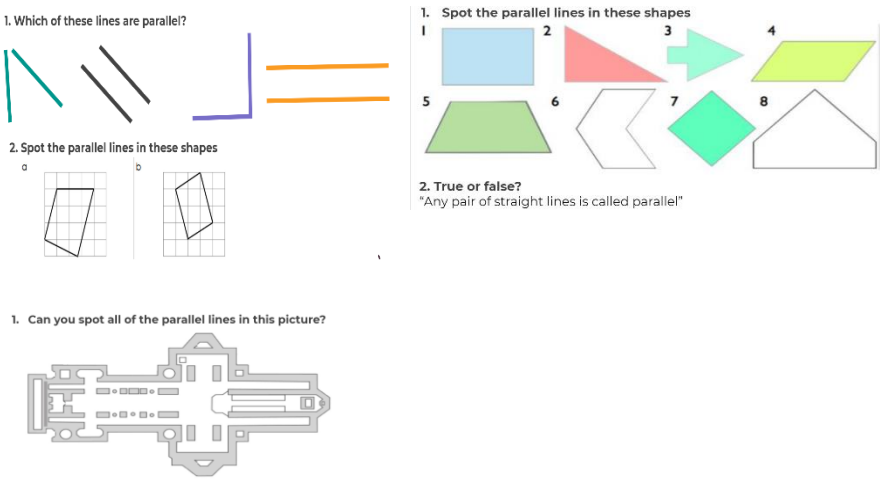
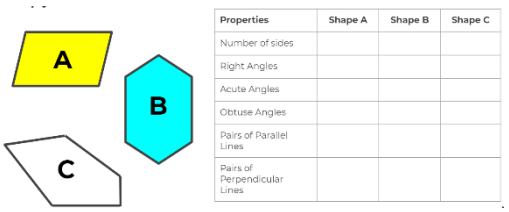
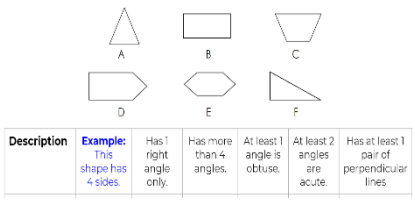
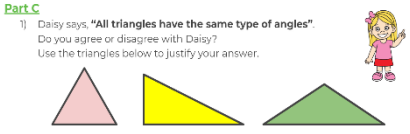
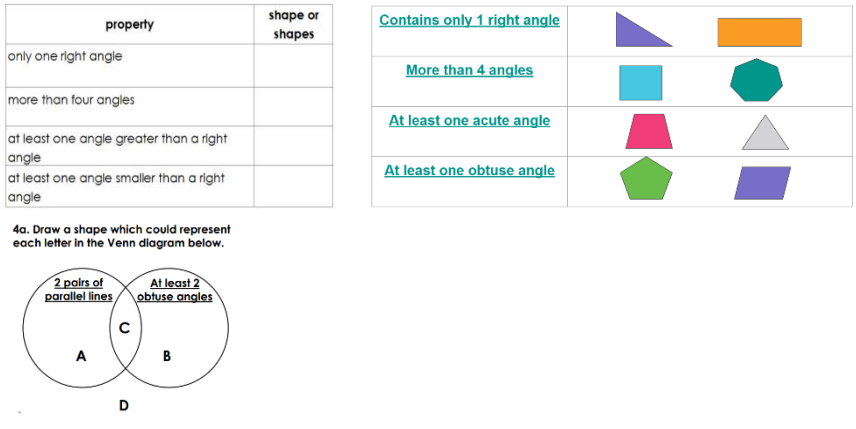
Resources/documents: White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, Garry Hall.org.uk

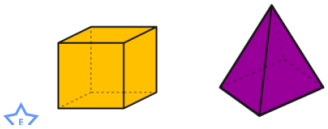
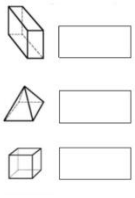
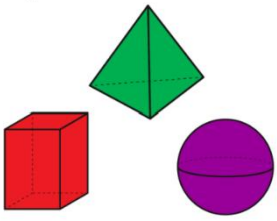
Real life discussion before teaching: driving, maps and mazes, shapes in the school and classroom environment, road signs,

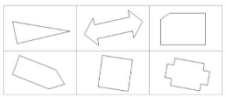
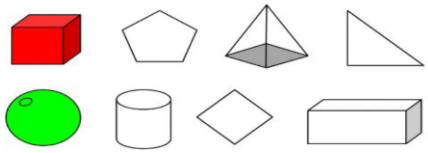
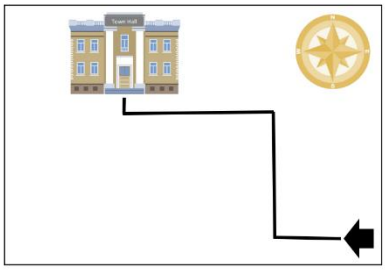
Pre- assessment	Assessment tasks	Language Focus
	White Rose assessment block	
Teaching sequence	Learning tasks	
WALT: Identify and recognise turns and angles	Recap names of 2D shapes. TEACH: Definition of angle – where pairs of lines meet. Find examples of angles around classroom using angle finder. Identify pairs of lines which create an angle and which do not. Look at angles in shapes -which are greater/smaller? How do we know? Organise angles in objects in a line according to size. 	turns, angles, lines,
WALT: Identify angles inside 2D shapes	Sort shapes into 2D and 3D Concrete: use angle finder to identify angles in 2D shapes. How many angles in x shape? Identify patterns – what do you notice about the number of sides and the number of angles?    Reasoning and problem solving:	2D shapes, triangle, square, rectangle, pentagon, hexagon, quadrilateral, star, parallelogram angles

WALT: Recognise right angles	Concrete: Which shapes have the most angles? What patterns have we already identified between no of sides and no of angles? Look at egs of right angles in real life contexts eg using clocks. Find egs of right angles in classroom using right angle finder Pictorial: Can you identify right angles:  Apply to 2D shape images. How do we record right angles on shapes? 	right angles, patterns, links
WALT: Recognise acute and obtuse angles	Compare angles of different sizes using vocab of greater, smaller and equal to (use symbols to compare)  Teach terms acute and obtuse. Relate to size of right angles. Find acute and obtuse angles in practical contexts: in classroom using real objects, 2d Shapes  	greater than, less than, equal to, acute, right angle, obtuse
WALT: Revise angles	Match acute, right and obtuse angle definitions with examples. 1. What angles are purple? 2. Which angles are pink? 3. Which angles are orange? Challenge - find another one of each 	greater than, less than, equal to, acute, right angle, obtuse

WALT: Identify perpendicular lines	Identify perpendicular lines in 2d shapes and in local environment  	perpendicular, 2D,

WALT: Draw perpendicular lines	Revise horizontal and vertical lines and teach how they relate to perpendicular lines. Find examples in real life and draw pp lines. 	horizontal, vertical, perpendicular, straight,
WALT: Identify and explain parallel lines	Identify features of parallel lines 	parallel lines
WALT: Describe 2D shapes based on their properties	Revise vocab of angles in relation to 2D shapes. Use shapes to identify how many sides, angles, types of angles. Can you find egs of parallel and perpendicular lines?   	2D shapes, triangle, square, rectangle, pentagon, hexagon, quadrilateral, star, parallelogram angles
WALT: Draw 2D shapes based on their properties	Draw shapes to fit given criteria: 	2D shapes, triangle, square, rectangle, pentagon, hexagon, quadrilateral, star, parallelogram acute, right, obtuse angles

WALT: Describe the properties of 3D shapes	Introduce new vocab: 3D, face, vertices. Discuss differences between 2D and 3D Look at egs of 3d shapes applying vocab to each one. Label 3d shapes. Match 3D shapes to their properties. **4a. Are the following statements always true, sometimes true or never true?** **A) A cube has an equal amount of faces to a cuboid.** **B) A square based pyramid has 4 triangular faces.**  This shape has five faces. It has eight edges and five vertices. This shape has eight vertices, six square faces and twelve edges. This shape has three pairs of parallel rectangular faces.  **5a. Which shape is the odd one out? Think about edges, vertices and faces.** **Explain your answer.** 	3D, face, vertices, edge

WALT: Identify and describe lines of symmetry in 2D shapes	Define symmetry in shapes. Look at real life egs – art, nature, architecture. Ch experiment folding paper then identify examples in 2D shapes. Draw- 1. A house with a line of symmetry 2. A symmetrical flower 3. A symmetrical face  Challenge - can you add another shape of your own into each column? Always, sometimes or never? A. Squares have lines of symmetry B. 2-D shapes have lines of symmetry C. The shape below has a line of symmetry  zero lines of symmetry | one line of symmetry | two or more lines of symmetry	line of symmetry, equal,
WALT: Revise knowledge of shapes	1. Are these shapes 2-D or 3-D?  Group me - How many different ways could you sort these shapes into groups? 2. True or False? A) 2D shapes can only have straight lines? B) Squares and rectangles have the same lines of symmetry? C) A cone is a 2D shape? 1. What is the difference between a cube and cuboid?  2. Which 3-D shape has only one circle face? 3. Which 2-D shape is a quadrilateral with 4 right angles and 4 equal sides? Challenge - Draw a 2-D shape with 3 sides. How many ways can you do this? What's the same and what's different? Mr Percy works for Little Acorn Council; he manages the town planning department. He works very hard to make sure that the Town is always improving.   Here is part of his planning for new roads in the town. He is writing instructions for how to get to the town hall from the starting point on the map. 1a. Circle the correct instructions. Go straight forward. Make a $\frac{1}{4}$ turn clockwise. Move straight forward. Make a $\frac{1}{4}$ turn clockwise. Move straight forward. Make a $\frac{3}{4}$ turn anti-clockwise. Go straight forward. Make a $\frac{1}{4}$ turn clockwise. Move straight forward. Make a $\frac{1}{4}$ quarter turn anti-clockwise. Move straight forward. Make a $\frac{1}{4}$ turn clockwise.	2D shapes, triangle, square, rectangle, pentagon, hexagon, quadrilateral, star, parallelogram acute, right, obtuse angles

Y4 Personalised Learning Journey

Geometry: Property of shape

NC Objectives:

Year 3

Pupils should be taught to:

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Year 4

Pupils should be taught to:

- compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes
- identify acute and obtuse angles and compare and order angles up to 2 right angles by size
- identify lines of symmetry in 2-D shapes presented in different orientations
- complete a simple symmetric figure with respect to a specific line of symmetry

Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation, deepening understanding resources Policies (Use of concrete), NCETM mastery assessment docs, past SATs questions. Deepening Understanding TTRS Prodigy Maths Classroom secrets

2D shapes, 3D shapes

Real life discussion before/, during teaching: Where do we use measure in real life:

EG: Looking at the planets, art and sculptures, describing things around the house,

Pre- assessment	Assessment tasks	Language Focus
	White rose assessment. PUMA assessment.	
Teaching sequence	**Learning tasks**	**Language Focus**
1. Turns and angles	Children recognise angles as a measure of a turn. They practice making 1/2 , 1/4 , 3/4 and whole turns from different starting points in both clockwise and anti-clockwise directions in practical contexts. They should listen to/follow instructions and also give instructions using the correct mathematical language in different contexts. Children understand that an angle is created when 2 straight lines meet at a point. **Key questions:** • If we start by facing _____ and make a _____ turn, what direction will we be facing? If we face _____ and turn to face _____, what turn have we made? • If we face north and make a quarter turn clockwise, which direction will we be facing? • What if we turn anti-clockwise? • What would the time be if the minute hand started at 1, then made a quarter of a turn?	

	• Can you see any angles around the classroom? **Possible misconceptions:** • Misunderstand clockwise and anticlockwise. • How to turn ¼, ½ and ¾	
2. Right angles in shapes.	Children recognise that a right angle is a quarter turn, 2 right angles make a half-turn, 3 right angles make three-quarters of a turn and 4 right angles make a complete turn. Children need to see examples in different orientations so that they understand that a right angle does not have to be made up of a horizontal and vertical lin **Key questions:** • How many right angles make a half turn/three-quarter turn/ full turn? • Where can you see a right angle in the classroom/ around school/ outside? • Which shapes contain right angles? • Can you think of a shape which doesn't have any right angles? How many right angles does a _____ have? • Can you draw a shape with _____ right angles? • What headings would we place in our table? **Possible misconceptions:** • Understanding of horizontal and vertical. • Misunderstand clockwise and anticlockwise	
3. Compare angles.	Children identify whether an angle is greater than or less than a right angle in shapes and turns, by measuring, comparing and reasoning in practical contexts. Children are introduced to the words 'acute' and 'obtuse' as a way of describing angles. **Key questions:** • What is an acute? (Give 3 examples of acute angles and ask them to identify what's the same about them. • Draw out that they are all smaller than a right-angle). • What's an obtuse angle? (Repeat activity by giving 3 examples of obtuse angles). • Can you give me a time where the hands on the clock make an acute/obtuse angle? • Can you see an acute/obtuse angle around the classroom? • Can you draw me a shape that contains acute/obtuse angles? **Possible misconceptions:** • misconception that a larger space between two lines of an angle means that the angle is larger than another angle with a smaller space.	

4. Identify angles	Children develop their understanding of obtuse and acute angles by comparing with a right angle. They use an angle tester to check whether angles are larger or smaller than a right angle. Children learn that an acute angle is more than 0 degrees and less than 90 degrees, a right angle is exactly 90 degrees and an obtuse angle is more than 90 degrees but less than 180 degrees. **Key questions:** • How many degrees are there in a right angle? • Draw an acute/obtuse angle. • Estimate the size of the angle. **Possible misconceptions:** • misconception that a larger space between two lines of an angle means that the angle is larger than another angle with a smaller space.	
5. Compare and order angles.	Children compare and order angles in ascending and descending order. They use an angle tester to continue to help them to decide if angles are acute or obtuse. Children identify and order angles in different representations including in shapes and on a grid. **Key questions:** • How can you use an angle tester to help you order the angles? • How many obtuse/acute/right angles are there in the diagrams? • Compare the angles to a right angle. • Does it help you to start to order them? • Rotate the angles so one of the lines is horizontal. • Does this help you to compare them more efficiently? **Possible misconceptions:** • misconception that a larger space between two lines of an angle means that the angle is larger than another angle with a smaller space. • Misidentify acute and obtuse angles. • Understanding of horizontal and vertical lines.	
6. Recognise and describe 2-D shapes	Children recognise, describe and draw 2-D shapes accurately. They use properties including types of angles, lines, symmetry and lengths of sides to describe the shape. They could be given opportunities to identify/draw a hidden shape from a	

	description given and also describe a shape for a friend to identify/draw **Key questions:** • How many angles does a _____ have? • What types of angles does a _____ have? • How many lines of symmetry does a _____ have? • What kind of lines of symmetry does a _____ have? (vertical/horizontal) • What types of lines can you spot in a _____? (perpendicular/parallel) • Can you guess the shape from the description given? • Can you draw a shape from the description given? **Possible misconceptions:** • Children may misplace the symmetry line. • Understand that the image should be mirrored on the opposite side. • Understand that the image would be flipped rather than exactly the same in appearance.	
7. Triangles	Teachers might start this small step by recapping the definition of a polygon. An activity might be to sort shapes into examples and non-examples of polygons. Children will classify triangles for the first time using the names 'isosceles', 'scalene' and 'equilateral'. Children will use rulers to measure the sides in order to classify them correctly. Children will compare the similarities and differences between triangles and use these to help them identify, sort and draw. **Key questions:** • What is a polygon? • What isn't a polygon? • What are the names of the different types of triangles? • What are the properties of an isosceles triangles? • What are the properties of a scalene triangle? • What are the properties of an equilateral triangle? • Which types of triangle can also be right-angled? • How are the triangles different? • Do any of the sides need to be the same length? **Possible misconceptions:** • angles in a triangle add up to 180°, and could correctly interpret the symbol for a right-angle, but made an arithmetic error when subtracting from 180.	

8. Quadrilaterals.	Children name quadrilaterals including a square, rectangle, rhombus, parallelogram and trapezium. They describe their properties and highlight the similarities and differences between different quadrilaterals. Children draw quadrilaterals accurately using knowledge of their properties. Teachers could use a Frayer Model with the children to explore the concept of quadrilaterals further **Key questions:** • What's the same about the quadrilaterals? • What's different about the quadrilaterals? • Why is a square a special type of rectangle? • Why is a rhombus a special type of parallelogram? **Possible misconceptions:** • Children assume quadrilateral is only rectangle.	
9. Horizontal and vertical	Children identify and find horizontal and vertical lines in a range of contexts. They identify horizontal and vertical lines of symmetry in shapes and symbols. **Key questions:** • What can you use to help you remember what a horizontal line looks like? (The horizon) • Can you see horizontal and vertical lines around the classroom? • What do we call a line that is not horizontal or vertical? • Which shapes/symbols/letters have a horizontal/vertical line of symmetry? • Which have both? • Can you draw your own shape that has a horizontal and vertical line of symmetry? **Possible misconceptions:** Misinterpret horizontal and vertical.	
10. Lines of symmetry	Children find and identify lines of symmetry within 2-D shapes. Children explore symmetry in shapes of different sizes and orientations. To help find lines of symmetry children may use mirrors and tracing paper. The key aspect of symmetry can be taught through paper folding activities. It is important for children to understand that a shape may be symmetrical, but if the pattern on the shape isn't symmetrical, then the diagram isn't symmetrical. **Key questions:** • Explain what you understand by the term 'symmetrical'. • Can you give any real-life examples?	

	• How can you tell if something is symmetrical? • Are lines of symmetry always vertical? • Does the orientation of the shape affect the lines of symmetry? • What equipment could you use to help you find and identify lines of symmetry? • What would the rest of the shape look like?	
11. Complete a symmetric figure.	Children use their knowledge of symmetry to complete 2-D shapes and patterns. Children could use squared paper, mirrors or tracing paper to help them accurately complete figures. **Key questions:** • What will the rest of the shape look like? • How can you check? • How can you use the squares to help you? • Does each side need to be the same or different? • Which lines need to be extended?	

Y5 Personalised Maths Learning Journey Date: WB:

NC Objectives:

- identify 3-D shapes, including cubes and other cuboids, from 2-D representations
- know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles
- draw given angles, and measure them in degrees (o)
- identify: angles at a point and one whole turn (total 360o)
- angles at a point on a straight line and 2 1 a turn (total 180o)
- other multiples of 90o
- use the properties of rectangles to deduce related facts and find missing lengths and angles
- distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

Resources/documents:

Ready to Progress Guidance, White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs.

Base 10, place value counters, part-whole models, bar models, real-life objects e.g. sweets etc.

Real life discussion before teaching:
Building, constructions, shopping, baking

Pre- assessment	Assessment tasks	Language Focus
Revision from previous years: • compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes • identify acute and obtuse angles and compare and order angles up to two right angles by size • identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry.	White Rose Year 4 Properties of Shape Assessment sheets.	
Teaching sequence	**Learning tasks**	**Language Focus**
1. WALT: To identify angles.	What is an angle? Show right angle, obtuse and acute. Discuss which is which and order from smallest to largest. Explain that if they	Right angle, obtuse, acute, degrees, intersecting lines

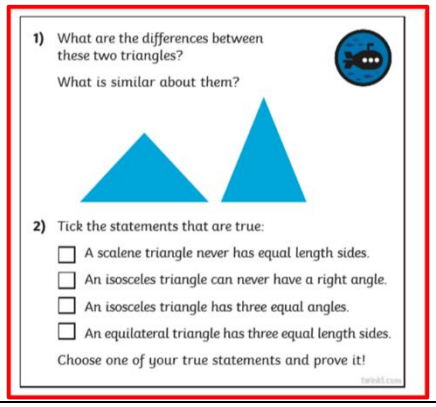
WILF: I will identify angles by comparing them as more or less than a right angle.	are larger than 90 degree they will be obtuse, and smaller will be acute. Give some examples. Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. LA- as rest of class but practical, have them make a right angle and then find things around the room, school or outside that has different angles. Can they then put them in a table?	
2. WALT: To compare and order angles. WILF: I will use coordinates to plot points on to a first quadrant.	Recap previous lesson. Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. LA- give them 3 different angles. Sort them like in the lesson yesterday (just on the table) and then order them. Repeat with 3 other angles (needs to be a right angle each time. Repeat again. Can they now take all the angles and order them?	Right angle, obtuse, acute, degrees, intersecting lines
3. WALT: To measure angles in degrees. WILF: I will measure angles using a clockface.	Show a clockface and how it can be read in terms of angles. Discuss clockwise and anti-clockwise. Model measuring on the clockface. Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. WORD PROBLEMS LA- children will measure angles using a clock. Identify and read 90 degrees first. Then obtuse of acute in multiples	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex

	of 5. Talk to them about counting backwards from 90 if it is closer to 90. Stick to 180 degrees and less unless their understand is secure.	
4. WALT: To measure angles with a protractor. WILF: I will measure angles less than 90˚ using the scale on a protractor.	Model using a protractor on the inside and outside scale up to 90˚. Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. LA- show angles- can they use it to check if an angle is acute or obtuse? Can they now measure if the angles are in multiples of 5 or 10?	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor
5. WALT: To measure angles with a protractor. WILF: I will measure angles less than 180˚ using the scale on a protractor.	Recap yesterday's learning and extend to apply to up to 180˚ Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. LA- as yesterday's lesson but with 180˚.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor
6. WALT: To draw lines and angles accurately. WILF: I will use a protractor to draw lines and angles to a given measurement.	Model how to draw using protractor. Show Kandinsky art as example of lines and angles. Problem solving and reasoning questions. LA- start by using a ruler to draw lines with measurements in full cms. If this is secure, try angles. Use only angles with measurements in multiples of 10 and then multiples of 5 when ready. Apply- give some angles with measurements that are obviously wrong. E.g. acute angle that is 95˚. Can this angle be that measurement? What could it be? Then have them draw what it should look like.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise

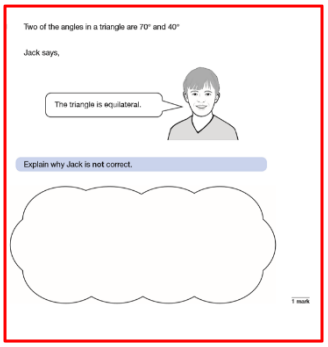
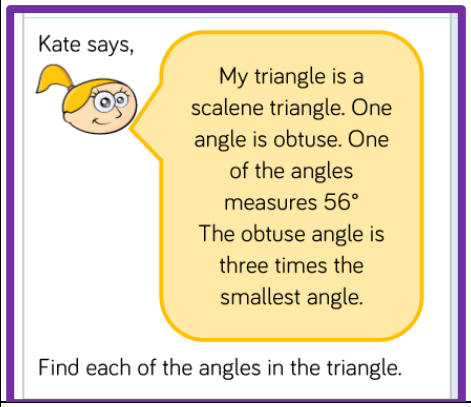
7. WALT: To calculate missing angles. WILF: I will use my knowledge of right angles and adding and subtraction skills to calculate the missing angle.	Model. Show what it would be look like as a bar model. Problem solving and reasoning questions. LA- recap anything from previous lesson if not secure or need recap. If not look at adding angles together. Give them angles with angle showing and have them add them together. Can they add three together.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise
8. WALT: To find angles in a full turn. WILF: I will use my knowledge of right angles and adding and subtraction skills to calculate the missing angle.	Remind that full circle is 360˚. Model finding missing angles in a full circle. Problem solving and reasoning questions. LA- continue from yesterday with 180˚ unless secure. If secure, chop up a circle in to 180, 90 and 45 degrees. Can they add them back together e.g. can they add 2x 180 together? What combinations can they make? Maybe they can all be different colours e.g. blue for 180, 90 is red, 45 is green.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise
9. WALT: To sort triangles. WILF: I will sort triangles based on their properties.	Show the different types of triangles. What do they children notice? Discuss difference. Can they children draw and label each triangle? Problem solving and reasoning questions. LA- have them cute different triangles out and sort.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise, triangle, equilateral, scalene, isosceles
10. WALT: To name different quadrilaterals. WILF: To use features of shapes to name and describe quadrilaterals.	Check children's understanding of the features e.g. parallel lines, sides, vertex, polygon etc. Show each shape and have children use vocab to identity features. Problem solving and reasoning questions. LA- have physical shapes. Describe as a group. Have words and definitions of features on a word mat for them to refer to. Can they sort them in to simple carol or Venn diagrams? I'm thinking of a shape game or feely bag.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise, triangle, equilateral, scalene, isosceles, quadrilaterals, polygon, parallel, trapezium square, rhombus, parallelogram
11.	Check children's understanding of the features e.g. parallel lines, sides, vertex, polygon etc.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise,

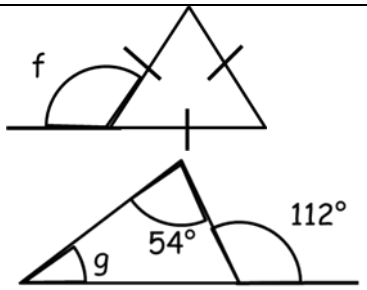
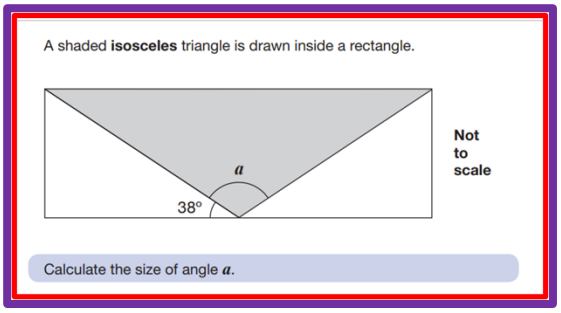
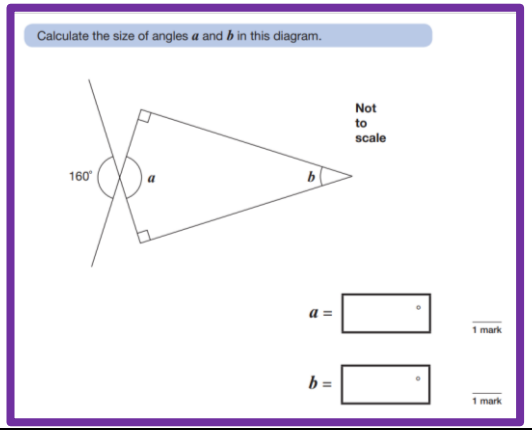
WALT: To distinguish between regular and irregular polygons. WILF: To identify and sort a range of regular and irregular polygons.	Discuss difference in regular and irregular polygons. Show some as examples. Problem solving and reasoning questions. LA- sort real shapes, then paper ones.	reflex, scale, protractor, draw, accurate, precise, triangle, equilateral, scalene, isosceles, quadrilaterals, polygon, parallel, trapezium square, rhombus, parallelogram, regular and irregular
12. WALT: To identify 3D shapes. WILF: I will use properties of shapes to identify 3D shapes.	As above but with 3D shapes and features. Problem solving and reasoning questions. LA- as above but with 3D shapes.	Right angle, obtuse, acute, degrees, intersecting lines, full-turn, quarter-turn, half-turn, clockwise, anti-clockwise, reflex, scale, protractor, draw, accurate, precise, triangle, equilateral, scalene, isosceles, quadrilaterals, polygon, parallel, trapezium square, rhombus, parallelogram, regular and irregular, 3D-shapes, 2D shapes, cube, cuboid, pyramid, prism, edge, face
13.		

Y6 Personalised Learning Journey Geometry properties of shape		
NC Objectives: • draw 2-D shapes using given dimensions and angles • recognise, describe and build simple 3-D shapes, including making nets • compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons • illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.		
Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, past SATs questions. Base 10. Place value counters.		
Real life discussion before/during teaching : shape in the real world- when do we see/use shape?		
Pre- assessment	Assessment tasks	Language Focus
Revision from previous years:	Shape taught in previous years	
Teaching sequence	Learning tasks	Language Focus
WALT: Identify 3D shapes and their properties	Recap on 3D shapes from previous years. Children to use concrete resources (3 D shapes) to identify the number of face, vertices, edges. Then move to pictorial- pictures of 3D shapes. Can they identify faces, edges vertices? Investigation: Which 3D shapes have the same number of faces as vertices? Which shapes have the same number of faces as a cube? Why	3 dimensional Vertices Faces Edges Names of 3D shapes
WALT: Make nets of 3D shapes	Give children lots of nets to make and then they match to given pictures. Move to abstract/pictorial- can they identify the shape from the net?	net
WALT: Identify types of line	Demonstrate what is meant by parallel and perpendicular lines. Children to identify these from a given set. Move onto 2D shapes – can they identify these lines in 2D shapes? Give different capital letters-which have parallel line and perpendicular lines? SATS questions related to this.	Parallel perpendicular
WALT: Identify different types of triangles	Explain the types of triangles and their properties	Isosceles Right-angles

	Can an isosceles, equilateral and scalene also be a right-angled triangle? Why/why not? Prove it. Show lots of examples. Children to identify different types of triangles. Move to problem-solving EG:  	Equilateral scalene Hypotenuse
WALT: Identify quadrilaterals	Recap on properties: vertices, right-angles, parallel and perpendicular lines. Give out statements which describe the various quadrilateral. Children work as a group to match the correct quadrilateral to its description. Make sure that children know the various trapezia (right angled, isosceles). Practise: Sorting diagrams EG Venn and carroll Apply: SATS questions	Rhombus Quadrilateral Kite Inverted kite (arrowhead) Square Oblong Rectangle Trapezium parallelogram
WALT: Identify regular and irregular polygons	As above but with regular and irregular pentagons, hexagons, heptagons, nonagons, decagons	regular irregular pentagons, hexagons, heptagons, nonagons, decagon polygon
WALT: Identify parts of a circle	Children draw a circle and label the parts. Ask: If the diameter is 10cm what would be the radius? If the radius is 18cm, what is the diameter Give children radius and diameter question to calculate. Apply: SATs questions GD: worded problems	Circumference Diameter Radius segment
WALT: Identify different types of angles and estimate their size.	Recap on different angles-children to make a poster of the various types.	Angle Interior Exterior

	Practise: Identifying different angles Apply: Estimating the size of acute and obtuse angles by using the knowledge of the size of a right angle EG a 45 degrees angle can be estimated because it is half of a right angle. GD: as apply but with reflex angles.	Straight line angle Right angle Acute angle Obtuse angle Reflex angle Estimate estimation
WALT: Use a protractor (angle measurer)	Demonstrate how to use a protractor accurately. Practise: Children to estimate and the measure angles using the protractor. Apply: Children to draw various acute and obtuse angles from a given point EG: .Draw a line (AB) for each angle. Using a protractor, at point B draw the following angles: 1. 90 degrees 2. 45 degrees 3. 23 degrees 4. 80 degrees 5. Which type of angles are these? (write at the side of each angle). GD: As apply but drawing reflex angles	Angles Protractor acute Obtuse reflex
WALT: Calculate the missing angles in triangles	Recap on types of triangles. Explain that angles in a triangle always add up to 180 degrees. Take a paper triangle, tear off the corners. Ask what a straight line angle measures (180 degrees). Place the corners of the triangle together and show that they equal 180 degrees. Go through each type of triangle: If all the angles are equal in an equilateral triangle, what does each angle equal? Scalene – show a triangle with 2 of the angles sizes shown. What would we do to calculate the missing angle? Repeat with right-angled scalene but without the size of the right angle shown. Isosceles triangle: Show with the two equal angles given and children calculate then with the two equal angles not given. Ensure they know that they need to subtract the given angle from 180 degrees then divide the answer by 2. Repeat with a right-angled isosceles triangle. Practise as above.	Isosceles Equilateral Scalene Right angled triangle Interior angles

	Apply:  GD:  	
WALT: Calculate the size of missing angles in quadrilaterals	As above but with different quadrilaterals: Rhombus Quadrilateral Kite Inverted kite (arrowhead) Square Oblong Rectangle Trapezium Parallelogram Teach that a quadrilateral is double a triangle and show this by cutting any quadrilateral in half. Explain that the interior angles always total 360 degrees.	Rhombus Quadrilateral Kite Inverted kite (arrowhead) Square Oblong Rectangle Trapezium parallelogram
WALT: Calculate missing angles on a straight line, around a point and vertically opposite angles.	Recap on the size of angles on a straight line and around a point. Show that vertically opposite angles are always equal. Practise finding missing angles as above. Apply: finding all missing angles incorporating missing angles in triangles and quadrilaterals EG:	Vertically opposite angles Equivalent equal

	 GD:  	
WALT: draw 2-D shapes using given dimensions and angles	Demonstrate how to use a ruler and protractor to draw various 2D shapes using given dimensions EG a scalene triangle with a right angle and the base of 9 cm in length.	Base Height length Protractor angle