



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 7 Prime – Perimeter and Area

Lesson objective	Intended Knowledge:	Tiered Vocabulary	Prior Knowledge:	Steps to Success	Feedback
To learn how to calculate the perimeter of 2D shapes.	<ul style="list-style-type: none"> Students will know how to calculate the perimeter of rectangles, triangles, trapezia and parallelograms. Students will know that the units used to represent perimeter are mm, cm and m etc. Students will know how to calculate the perimeter of compound shapes. Students will know how to use inverse operations to find the missing lengths of shapes when given the perimeter. Students will know how to solve simple real-life problems involving perimeter. 	<p>Perimeter – the distance around the outside of a shape</p> <p>Compound shape – a shape made up of two or more geometric shapes</p>	<ul style="list-style-type: none"> Students need to identify and recall properties of regular and irregular 2D shapes. 	<p>Steps to Success – Perimeter</p> <p>To calculate the perimeter, add the length of all of the sides together. Remember even if there are only two measurements on the shape if it has 4 sides you will need to add 4 numbers.</p> <p>Steps to Success – Perimeter of compound shapes</p> <p>Step 1: Firstly, identify whether or not you need to find any missing lengths, if it is necessary subtract the smaller length from the larger length.</p> <p>Step 2: Add up the lengths of all the sides.</p> <p>Step 3: Don't forget to write your units – cm or mm or m.</p>	
To learn how to calculate the area of rectangles, parallelograms and triangles.	<ul style="list-style-type: none"> Students will know how to calculate the area of rectangles. Students will know how to calculate area of a parallelogram. Students will know how to calculate the area of a triangle. Students will know to ignore any additional lengths in the rectangles, parallelograms and triangles. Students will know how to use inverse operations to find the missing lengths of shapes when given the area. Students will know how to use area to solve simple real-life problems. 	<p>Area – the amount of space inside a 2D shape</p> <p>Parallelogram – a four-sided shape with two pairs of parallel opposite sides.</p>	<ul style="list-style-type: none"> Students need to know how to multiply integers and decimals. Students need to know how to identify rectangles, parallelograms and triangles. 	<p>Steps to Success – Area of shapes</p> <p>Step 1 – Identify the formula from the list needed:</p> <ul style="list-style-type: none"> Area of a Square/Rectangle = Base x Height Area of a Parallelogram = Base x Height Area of a Triangle = $\frac{1}{2} \times \text{Base} \times \text{Height}$ <p>Step 2 – Substitute the measurements into the required formula.</p> <p>Step 3 – Don't forget to write your units cm^2 or mm^2 or m^2.</p>	
To learn how find the area of compound shapes and trapezia.	<ul style="list-style-type: none"> Students will know how to calculate the area of compound shapes. Students will know how to identify the parallel lines in a trapezium. Students will know how to calculate the area of a trapezium <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to use inverse operations to find the missing sides of a compound shape. Students will know how to use inverse operations to find the height or missing side of a trapezium. 	<p>Area – the amount of space inside a 2D shape</p> <p>Trapezium – a quadrilateral with one pair of sides parallel.</p> <p>Compound shape – a shape made up of two or more geometric shapes</p>	<ul style="list-style-type: none"> Students need to know how to find the area of rectangles and triangles. Students need to know how to substitute in to expressions/formulae. 	<p>Steps to Success – Area of trapezia $\frac{1}{2}(a+b)h$</p> <p>Step 1: Label your trapezium, a and b are the parallel lengths of your trapezium and h is the perpendicular height.</p> <p>Step 2: Substitute a, b and h into the formula $\frac{1}{2}(a + b)h$.</p> <p>Step 3: Calculate using BIDMAS.</p> <p>Step 4: Don't forget to write your units - cm^2 or mm^2 or m^2. To calculate the missing sides of a trapezia, the inverse operations of $\frac{1}{2}(a + b)h$ will be used.</p> <p>Steps to Success – Area of compound shapes</p> <p>Step 1: Firstly, identify whether or not you need to find any missing lengths, if it is necessary subtract the smaller length from the larger length.</p> <p>Step 2: Divide the compound shape into smaller shapes, and calculate the area of each individual shape.</p> <p>Step 3: To find the total area of the compound shape, add the area of the individual shapes together.</p> <p>Step 4: Don't forget to write your units - cm^2 or mm^2 or m^2.</p>	

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To learn how to find the circumference of a circle.	<ul style="list-style-type: none"> Students will know how to calculate the circumference of a circle when given the diameter. Students will know how to find the circumference of a circle. Students will be able to leave answers in terms of π and rounded to an appropriate degree of accuracy. Students will know how to find the circumference of a circle when the diameter or radius is known (mixture). Students will know how to calculate the perimeter of a semi-circle. Students will know how to calculate the perimeter of a quarter circle Students will know how to calculate the perimeter of a three-quarter. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to solve problems involving the circumference of circles. 	<p>Radius – a straight line from the centre to the circumference of a circle or sphere</p> <p>Diameter – a straight line passing from side to side through the centre of a body or figure, especially a circle or sphere</p> <p>π – the ratio of a circle's circumference to its diameter.</p> <p>Circumference – the perimeter of a circle</p>	<ul style="list-style-type: none"> Students need to know how to round to a given decimal place or significant figure. Students need to know how to substitute value into expressions/formulae. 	<p>Steps to Success: Circumference of a circle</p> <p>Step 1: Find the diameter of your circle, if you are given the radius, double it to find the diameter.</p> <p>Step 2: Substitute your diameter into the formula – $\pi \times d$</p> <p>Step 3: Type your calculation in the calculator.</p> <p>Step 4: Write your answer from the calculator, check to see if the question wants you to round or answer in terms of π.</p> <p>Steps to Success: Circumference of a semi-circle/quarter circle</p> <p>Step 1: Find the diameter of your circle, if you are given the radius, double it to find the diameter.</p> <p>Step 2: Substitute your diameter into the formula – $\pi \times d$</p> <p>Step 3: Divide the circumference of the circles by 2 for semi circle, 4 for quarter of a circle.</p> <p>Step 4: Add the diameter onto the circumference of the semi circle</p>	
To learn how to find the area of a circle.	<ul style="list-style-type: none"> Students will know how to calculate the area of a circle when the radius is given. Students will know how to calculate the area of a circle when a diameter is given. Students will know how to find the area of a circle when the diameter or radius is known (mixture). Students will know how to calculate the area of a semi-circle. Students will know how to calculate the area of a quarter circle. Students will know how to calculate the area of a three-quarter circle. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to solve problems involving the area of circles. 	<p>Area – the amount of space inside a 2D shape</p>	<ul style="list-style-type: none"> Students need to know how to round to a given decimal place or significant figure. Students need to know how to substitute value into expressions/formulae. 	<p>Steps to Success: Area of a circle</p> <p>Step 1: Find the radius of your circle, if you are given the diameter, half it to find the radius.</p> <p>Step 2: Substitute your radius into the formula – πr^2</p> <p>Step 3: Type your calculation in the calculator.</p> <p>Step 4: Write your answer from the calculator, check to see if the question wants you to round or answer in terms of π</p> <p>Steps to Success: Area of a semi circle/quarter circle</p> <p>Step 1: Find the radius of your circle, if you are given the diameter, half it to find the radius.</p> <p>Step 2: Substitute your radius into the formula – $\frac{\pi r^2}{2}$ for a semi circle or $\frac{\pi r^2}{4}$ for a quarter circle.</p> <p>Step 3: Type your calculation in the calculator.</p> <p>Step 4: Write your answer from the calculator, check to see if the question wants you to round or answer in terms of π</p>	
To consolidate understanding of area and perimeter.	<ul style="list-style-type: none"> Students will know how to find the perimeter of shapes, including compound shapes. Students will know how to find the circumference of circles and semi circles. Students will know how to find the area of rectangles, triangles, parallelograms, compound shapes, trapezia and circles 		<ul style="list-style-type: none"> 	<p>Use steps from previous lessons.</p>	

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<p>To learn how to calculate missing sides using Pythagoras' Theorem.</p>	<ul style="list-style-type: none"> Students will know how to find the hypotenuse, using Pythagoras' theorem Students will know how to find the shorter sides of the triangle using Pythagoras' theorem. Students will know how to identify whether they need to add or subtract when using Pythagoras' theorem. They will know that it is important to label the sides. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to solve simple problems involving Pythagoras' Theorem. 	<p>Hypotenuse – the longest side in a right-angled triangle. It can always be found opposite the right angle</p> <p>Theorem – a statement that has been proved, or can be proved</p>	<ul style="list-style-type: none"> Students will need to substitute values into expressions/formulae. Students need to be able to square and square root numbers. 	<p>Steps to Success: Using Pythagoras' Theorem to find the hypotenuse.</p> <p>Step 1: In order to find the missing side of a triangle using Pythagoras' theorem, we need to work out which side corresponds to each of the letters a, b and c in the equation $a^2+b^2=c^2$, remembering that the longest side is the hypotenuse which is known as c. a and b will be either one of the two perpendicular sides.</p> <p>Step 2: Label your diagram.</p> <p>Step 3: Next we substitute the values into the equation $a^2+b^2=c^2$</p> <p>Step 4: Calculate the square numbers and then add the values (BIDMAS).</p> <p>Step 5: Don't forget to square root your value to get the length of the side.</p> <p>Step 6: Round your answer to an appropriate degree of accuracy if necessary.</p> <p>Step 7: Check that your answer looks right. Is the hypotenuse the longest side?</p> <p>Steps to Success: Using Pythagoras' Theorem to find one of the perpendicular sides.</p> <p>Step 1: In order to find the missing side of a triangle using Pythagoras' theorem, we need to work out which side corresponds to each of the letters a, b and c in the equation $a^2+b^2=c^2$, remembering that the longest side is the hypotenuse which is known as c. a and b will be either one of the two perpendicular sides.</p> <p>Step 2: Label your diagram.</p> <p>Step 3: Next we substitute the values into the equation $a^2+b^2=c^2$</p> <p>Step 4: Rearrange the equation to get either $a^2= c^2- b^2$ OR $b^2= c^2- a^2$</p> <p>Step 5: Calculate the square numbers and then add the values (BIDMAS).</p> <p>Step 6: Don't forget to square root your value to get the length of the side.</p> <p>Step 7: Round your answer to an appropriate degree of accuracy if necessary.</p> <p>Step 8: Check that your answer looks right. Is the hypotenuse the longest side?</p>	
<p>To learn how to calculate missing sides in right-angled triangles using trigonometry. (Lesson 1)</p>	<ul style="list-style-type: none"> Students will know the trigonometric ratio sine, cosine and tan. Students will know how to label the sides of a right-angled triangle; hypotenuse, opposite, adjacent. Students will know hypotenuse to mean, the longest side of a right-angled triangle, opposite to be the side opposite the angle in the question and adjacent being the side next to the angle. 	<p>Trigonometry – the relationships between side lengths and angles of triangles</p> <p>Hypotenuse – the longest side in a right-angled triangle. It can always be found opposite the right angle</p>	<ul style="list-style-type: none"> Students will need to substitute values into expressions/formulae. 	<p>Steps to Success – Calculating a missing side using SOHCAHTOA:</p> <p>Step 1: Label the sides O, H and A.</p> <p>Step 2: Circle the side you know and the side you are trying to find.</p> <p>Step 3: Identify the trig function you are using (sin, cos or tan).</p>	

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	<ul style="list-style-type: none"> Students will know how to identify the correct trigonometric ratio, by eliminating the side that they do not need. Students will know how to use the correct trigonometric ratio to find the missing side in a triangle. Students will know how to input the trigonometric values onto a calculator. Students will know how to fill in the trigonometric triangles. 	<p>Adjacent – next to, in maths the adjacent side in a right-angled triangle is the side that is adjacent to the angle, forming the angle with the hypotenuse</p> <p>Opposite – for right angled triangles the opposite is the side opposite the angle that we know or are trying to find.</p>		<p>Step 4: Substitute the lengths and angles into the correct place in the formula triangle.</p> <p>Step 5: Write down the calculation you need to do and then use your calculator to work out the answer.</p>	
To learn how to calculate missing sides in right-angled triangles using trigonometry. (Lesson 2)	<ul style="list-style-type: none"> Students will know how to find the missing side in a right-angled triangle by using trigonometry. <p>Opportunity for challenge:</p> <ul style="list-style-type: none"> Students will know how to find the missing angle in a right-angled triangle using trigonometry. 		<ul style="list-style-type: none"> Students need to know how to label a right-angled triangle and pick the appropriate trigonometric ratio needed to find the missing side. 	<p>Steps to Success – Calculating a missing angle using SOHCAHTOA:</p> <p>Step 1: Label the sides O, H and A.</p> <p>Step 2: Circle the two sides you know.</p> <p>Step 3: Identify the trig function you are using (sin, cos or tan).</p> <p>Step 4: Substitute the lengths and angles into the correct place in the formula triangle.</p> <p>Step 5: Write out the formula that is created.</p> <p>Step 6: Use the inverse trig function to calculate the missing angle (\sin^{-1}, \cos^{-1}, \tan^{-1}).</p>	
Mini-Assessment 9					