

Subject	Year	Month	
Mathematics	7	April	

Topic:


PERIMETER, AREA, SURFACE AREA & VOLUME LESSONS: 6

Content (Intent)

<p>Prior Learning</p> <p>KEY STAGE 2:</p> <ul style="list-style-type: none"> • meaning of area, perimeter, volume and capacity • areas of rectangles & parallelograms • area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height} = \text{base} \times \text{height} \div 2 = \frac{bh}{2}$ <p>Y7 : Properties of 2D and 3D shapes earlier in the year.</p>	<p>Future Learning</p> <p>Year 8 – Area and perimeter of compound shapes</p> <p>Year 8 – Volume of a cylinder</p> <p>Year 9 – Surface area of prisms and cylinders</p>
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<p>Objectives</p> <ul style="list-style-type: none"> • Perimeter at a higher level <ul style="list-style-type: none"> ○ compound shapes with missing side labels. ○ Mixture of units ○ Use of fractions ○ Simplifying algebraic expressions • Surface area of cubes and cuboids (area of squares and rectangles seen in KS2) • Use and apply the formula to calculate the area of triangles (recap from KS2) • Use and apply the formula to calculate the area of trapezia • Use and apply the formula to calculate the volume of cuboids (area cross section x depth, multiply three sides) 	<p>For teaching purposes</p> <p>Possible questions</p> <ul style="list-style-type: none"> • Always / Sometimes / Never: The value of the volume of a cuboid is greater than the value of the surface area • Convince me that the area of a triangle = $\frac{1}{2} \times \text{base} \times \text{height} = \text{base} \times \text{height} \div 2 = \frac{bh}{2}$ • (right-angled trapezium base: 8 cm, h: 5 cm, top: 6 cm) Kenny uses the formula for the area of a trapezium and Benny splits the shape into a rectangle and a triangle. What would you do? Why? <p>Possible Misconceptions</p> <ul style="list-style-type: none"> • may use the sloping height instead of perpendicular • may forget to divide by 2 to find the area of a triangle • may think that you multiply all the numbers to find the area of a shape • may confuse the concepts of surface area and volume • may only find the area of the three 'distinct' faces when finding SA
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Pedagogical notes (implementation)	How will understanding be assessed & recorded (Impact)
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<p>Parallelogram: You can visually cut off the corner and relocate it on the other side to show the connection with the area of a rectangle</p> <p>Trapezium</p> <ul style="list-style-type: none"> • Derive the formula for the area of a trapezium as $\frac{(a+b)h}{2}$ by copying and rotating a trapezium as shown here. • Using the smallest base would give an area too small. Using the biggest base would give an area too large. Use the average between both bases. (add and divide by 2)  <p>Volume cuboids Treat a cuboid as a prism. Area cross section x depth or height Do not just multiply tell students to multiply three sides</p>	<p>End of Year Assessment in June/July</p> <hr/> <p>How can parents help at home?</p> <hr/> <p>MathsWatch clips (Qualification ...) G8a, G8b, G21b, G20c, G20d, G21a</p>
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Further reading/discussion

<p>Reading / Enrichment</p> <p>KM: Equable shapes (for both 2D and 3D shapes)</p> <p>KM: Triangle takeaway</p> <p>KM: Surface area</p> <p>KM: Class of rice</p> <p>KM: Stick on the Maths: Area and Volume</p> <p>KM: Maths to Infinity: Area and Volume</p> <p>NRICH: Can They Be Equal?</p>	<p>Literacy</p> <p>Perimeter, area, volume, capacity, surface area</p> <p>Square, rectangle, parallelogram, triangle, trapezium (trapezia)</p> <p>Polygon, Formula, formulae</p> <p>Length, breadth, depth, height, width, Perpendicular height</p> <p>Cube, cuboid, Square millimetre, square centimetre, square metre, square kilometre, Cubic centimetre, centimetre cube</p>	<p>Numeracy Links</p>	<p>Careers Links</p> <p>Designer</p> <p>Product designer</p> <p>Town planners</p> <p>Architects</p>
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