Subject	Year	Month	
Mathematics	7	March/April	Balcarras *From strength to strength*

Topic:

AREA AND VOLUME
LESSONS: 5

Content (Intent)

Prior Learning
KEY STAGE 2:
- meaning of area, perimeter, volume and capacity
- areas of rectangles & parallelograms
- area of a triangle = ½ × base × height = base × height ÷ 2 = $\frac{bh}{2}$
- Know appropriate metric units for measuring area and volume

Objectives
- Perimeter of compound shapes with missing side labels. (Perimeter seen in KS2)
- 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)

Future Learning
Year 8 – Area and perimeter of compound shapes

For teaching purposes
Possible questions
- 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 = ½ × base × height = base × height ÷ 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?

Possible Misconceptions
- 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

Pedagogical notes (implementation)	How will understanding be assessed & recorded (Impact)

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

Trapezium
- 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)

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

End of Year Assessment in June/July

How can parents help at home?

MathsWatch clips (Qualification …)
G8a, G8b, G21b, G20c, G20d, G21a

Further reading/discussion

Reading / Enrichment
KM: Equable shapes (for both 2D and 3D shapes)

KM: Triangle takeaway

KM: Surface area

KM: Class of rice

KM:Stick on the Maths: Area and Volume

KM: Maths to Infinity: Area and Volume

NRICH: Can They Be Equal?

Literacy
Perimeter, area, volume, capacity, surface area
Square, rectangle, parallelogram, triangle, trapezium (trapezia)
Polygon, Formula, formulae
Length, breadth, depth, height, width, Perpendicular height
Cube, cuboid, Square millimetre, square centimetre, square metre, square kilometre, Cubic centimetre, centimetre cube

Numeracy Links

Careers Links
Designers