

Mathematics Knowledge Organiser

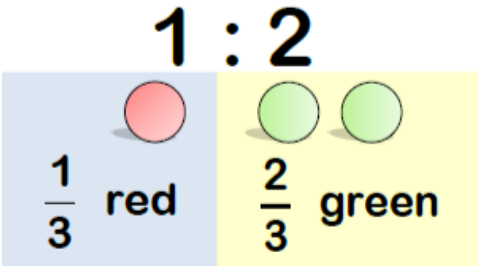
Year 8 – Spring T1

'Ratio'

The Knowledge for Progression:

- To know that a ratio is a comparison of two or more quantities in relation to each other.

Speak Like a Mathematician

Key Word	Dual Coding	Definition
Ratio		A part-to-part comparison.

'Proportion'

The Knowledge for Progression:

- To know that proportion is a multiplicative relationship between values, as one value increase so does the other.
- To know that inverse proportion is the multiplicative relationship between values, where one value increases the other decreases.
- To know that an exchange rate is the proportional relationship between 2 currencies.
- To know that better value for money is when the cost per unit is less.

Speak Like a Mathematician

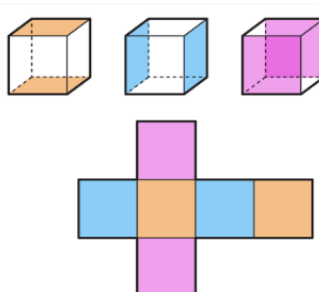
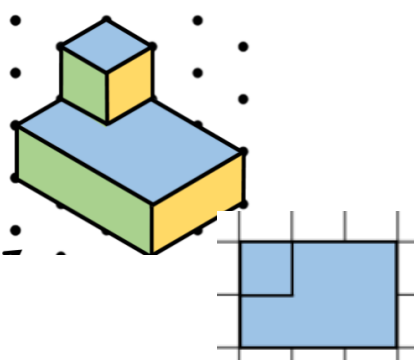
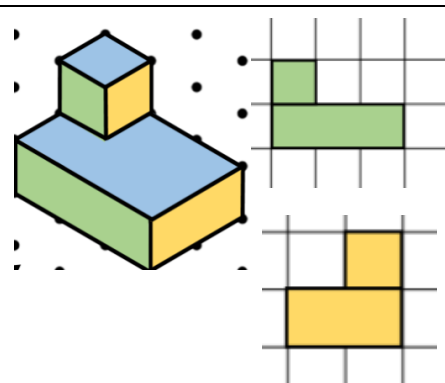
Key Word	Dual Coding	Definition
Proportion	<p>$3:4 = 6:8$ (x 2 on both sides)</p> <p>$3:4 = 6:2$ (x 2 on left, ÷ 2 on right)</p> <p>Direct Proportion Quantity 1 ↑ Quantity 2 ↑</p> <p>Inverse Proportion Quantity 1 ↑ Quantity 2 ↓</p>	A mathematical relationship, where quantities are increasing or decreasing in the same ratio.

'Nets, plans and elevations'

The Knowledge for Progression:

- To know that the net of a 3D shape is what the shape would look like if unfolded. It is made up of the faces of the 3D shape.
- To know that the plan is the view of a 3D object from above.
- To know that the front and side elevations are the views of a 3D object from the front and side.

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Key Word	Dual Coding	Definition
Net		A 2D representation of a 3D shape unfolded
Plan		The view of a 3D object from above
Elevation		The view of a 3D object from the front or the side

'Surface area of prisms'

The Knowledge for Progression:

- To know that surface area is the sum of the area of the faces of a 3D shape.
- To know that a face is a 2D side that makes up a 3D shape.
- To know that a prism is a 3D shape with a uniform cross section. The cross section is a polygon.
- To know that the uniform cross-section is the polygon that is runs throughout the prism.

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Key Word	Dual Coding	Definition
Area		The space inside a 2D shape
Surface Area		The total area of all the faces of a 3D shape added
Prism		A 3D shape with a uniform cross section. The cross section is a polygon
Uniform cross-section		The same face that runs through the length of a 3D shape.

'Rotation'

The Knowledge for Progression:

- To know that a rotation is the turning of a shape around a centre of rotation.
- To know that the centre of rotation is the fixed point which you rotate the shape about.
- To know that rotational symmetry is the property a shape has when it looks the same after a partial turn.
- To know that the order of rotational symmetry is the number of times the shape fits exactly into itself during a full rotation of 360° .

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Key Word	Dual Coding	Definition
Rotation		The turning of a shape around a centre of rotation.
Centre of rotation		The fixed point which you rotate the shape about.
Rotational symmetry		A property of a shape when it looks the same after a partial turn.
Order of rotational symmetry		The number of times the shape fits exactly into itself during a full 360° rotation.

'Bank Statements'

The Knowledge for Progression:

- To know how to calculate a balance.
- To know how to calculate a credit.
- To know how to calculate a debit.

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Key Word	Dual Coding	Definition
Balance		The amount of money in your bank account.
Credit		Money going into your bank account.
Debit		Money going out of your bank account.

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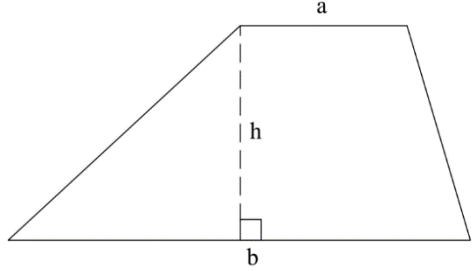
Year 8 – Spring T2

'Area of a trapezium'

The Knowledge for Progression:

- To know that the area of a trapezium is half of the sum of the parallel sides multiplied by the perpendicular distance between them.
- To know that the formula to find the area of a trapezium is $\frac{(a+b)}{2}h$. Where a and b are the parallel sides.

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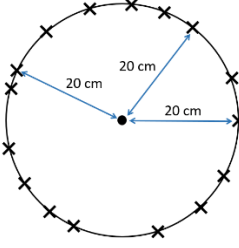
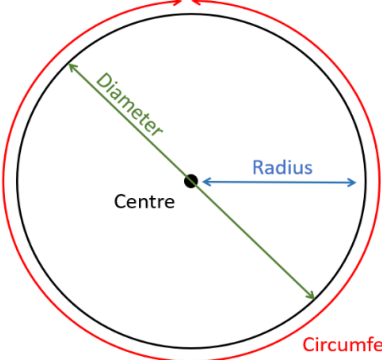
Key Word	Dual Coding	Definition
Trapezium	 <p>The diagram shows a trapezium with a shorter top horizontal side labeled 'a' and a longer bottom horizontal side labeled 'b'. A vertical dashed line from the top side to the bottom side is labeled 'h', representing the height. A right-angle symbol is shown at the intersection of the height line and the bottom side.</p>	A quadrilateral with one pair of parallel sides.

'Area and circumference of circles'

The Knowledge for Progression:

- To identify the parts of a circle; radius, diameter and circumference.
- To know that the radius is the distance from the centre of the circle to its circumference.
- To know that the diameter is the distance from one point of the circumference to another point going through the centre.
- To know that the circumference is the perimeter of the circle.
- To know that the diameter is twice the radius.
- To know that the radius is half of the diameter.
- To know that the formula to calculate the area of a circle is $A = \pi \times radius^2$.
- To know that the formula to calculate the circumference of a circle is $C = \pi \times diameter$.

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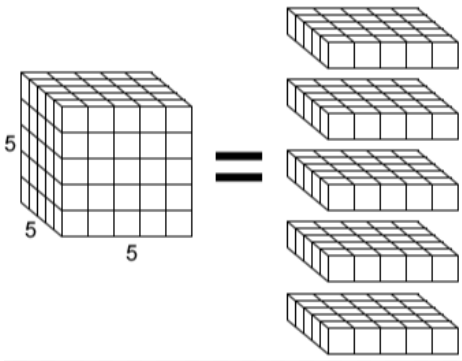
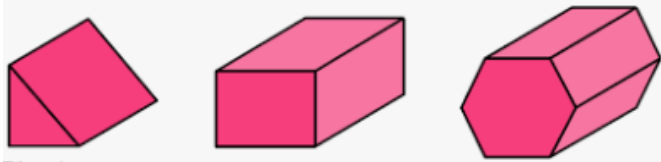
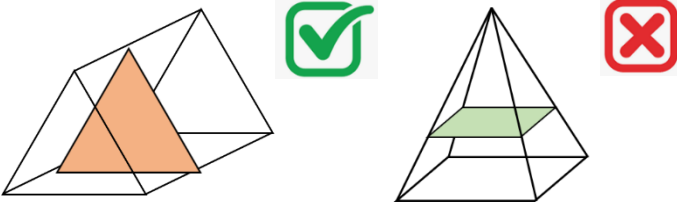
Key Word	Dual Coding	Definition
Circle		A 2D shape where all points are equidistant from the centre.
Radius		The distance from the centre of the circle to the circumference.
Diameter		The distance from one point of the circumference to another point going through the centre.
Circumference		The perimeter of the circle.

'Further volume of prisms'

The Knowledge for Progression:

- To know that volume = area of the cross-section x length
- To know that volume is the number of cube units inside the shape

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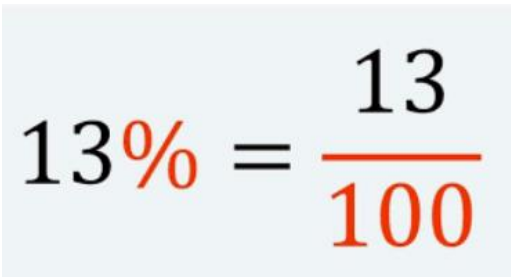
Key Word	Dual Coding	Definition
Volume		The number of cube units inside a 3D shape
Prism		A 3D shape with a uniform cross section. The cross section is a polygon
Uniform cross-section		The same face that runs through the length of a 3D shape.

'Percentages'

The Knowledge for Progression:

- To know that multipliers are percentages expressed in decimal form.
- To know that any original amount is 100%.

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Key Word	Dual Coding	Definition
Percentage		Per one hundred.
Multiplier	$25\% \equiv 0.25$ $140\% \equiv 1.4$	The equivalent decimal to a percentage.