Proportional Reasoning

Direct Proportion (Non-Algebraic)	Calculate missing values using direct proportion. Include Pie Chart calculations	Helping friends move house
Recipes	Use proportionality to scale ingredients for required amounts. Use unitary and multiplicative reasoning methods. Include problems involving limiting factors.	Be able to scale up/down a recipe you want to cook. Working out how much/many you can make with the ingredients you have
Best Buy Problems	Calculate unit costs and scaling methods in order to compare the best value. Also include problems with non unitary offers such as percentage and buy one get one free etc.	Shopping - getting the most for your money
Conversion Graphs	Use conversion graphs to calculate a variety of conversions. Including those that are beyond the given graph scale. Include situations that require use of multiple conversion graphs and currency conversions.	Being able to use to convert between different currencies when going on holiday
Exchange Rates	Use given exchange rates of any currency to convert given amounts. Include situations that require more than one conversion. Use exchange rates to compare best value.	Getting the most for your money - whether to buy at home or abroad. Understanding how exchange rates work for going on holiday
Water Project 2 - 3 lessons	Finding the best value for money Converting units Converting currency Using Conversion graphs	

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Similar Shapes with Lengths	Calculate similar lengths of shapes both larger and smaller. Understand that the angle is not affected.	Designers and architects scaling up drawings
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Similar Shapes (Area and Volume)	Calculate similar areas and volumes.	Designers and architects scaling up drawings into 3D objects/ buildings/structures
Water Project 2 - 3 lessons	Finding the best value for money Converting units Converting currency Using Conversion graphs	

Key Knowledge/Prior Learning KS2/3 and Retrieval and Suggested Starters

- Increasing or decreasing an amount by a percentage when finding the best value for money e.g. discount in a sale or increase of VAT.
- Identifying straight line graphs.
- Converting units of length and area.
- Ratio (unitary method)
- Division
- Multiplication
- Decimals

KS3 National Curriculum – what students will be practicing and Key Questions

- Calculating missing values using direct proportion. Explore different methods by either scaling up or down or using unitary method.
- Using proportionality to scale recipes for required amounts, including problems where students are given limiting factors
- Comparing different products and identifying which one is the better value for money.
- Using a conversion graph to convert between different units including length and currency.
- Using exchange rates to convert between different currencies. Use real life examples and discuss the difference between buy and sell exchange rates.
- Understanding the definition of similar shapes and using previous knowledge of converting units of length and area to find the length and area of similar shapes.

Specific Ambitious Knowledge

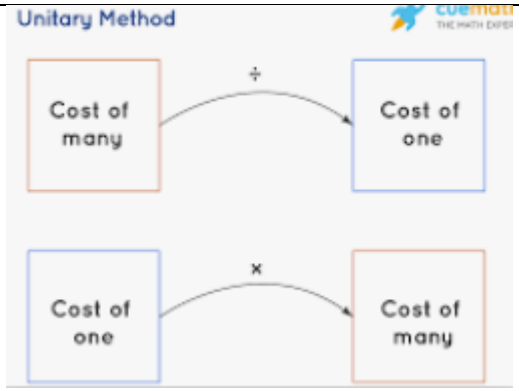
- Exploring different methods by either using multiplicative methods or the unitary method.
  The relationship between length scale factors and area scale factors.

Key Vocabulary/Literacy Opportunities

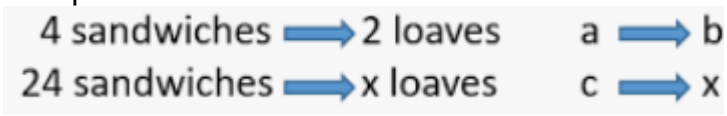
- Similar
- Congruent
- Proportion
- Exchange
- Conversion
- Direct proportion
- Indirect proportion
- Unitary method

Key Formulae/Knowledge (Misconceptions)

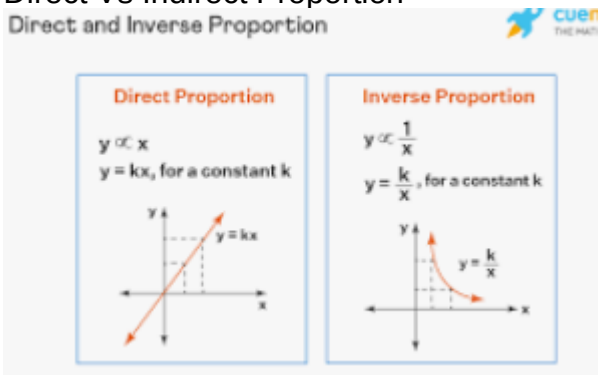
Unitary Method



Multiplicative Method



Direct Vs Indirect Proportion

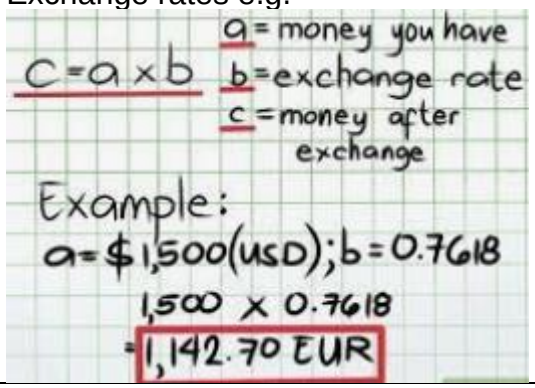


Students not understanding context and using direct proportion

Finding exchange rates

$$\text{Exchange Rate} = \frac{\text{Money in After Exchange}}{\text{Money Before Exchange}}$$

Exchange rates e.g.



Maths in Context (Historical, Real Life and Student Thinking Points)

Projects/Enrichment/Investigations
Water project – Students are in charge of a company that sells bottled water. The company is looking to: • Sell different bottles at different prices so students will need to compare them and find the best value. • Open offices in different places so students will need to convert between different distances and currencies