



Big Question - Multiplication and Division

AoLE: Mathematics and Numeracy	Subject: Maths	Year: 8
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Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
How do we make sure that the next batch of orange paint is the same colour as the last one?	Pupils will firstly explore the use of ratio notation and how ratios are represented. Pupils will gain an appreciation of how quantities can be shared in a ratio and then further exploration of simplifying ratios to their smallest integer value. Pupils will later examine multiplicative change and its impact on currency conversion and scale diagrams. Pupils will finally explore multiplication and division within fractions.	Multiplication Division Fractions Scales Algebra

What does progression look like in this 'Big Question?'

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression / Knowledge
Excelling	<p>I can fluently and accurately apply the four arithmetic operations in the correct order with integers, decimals and fractions, consolidating my understanding of reciprocals when dividing fractions.</p> <p>I can apply percentages and ratio to solve problems including simple and compound interest, appreciation and depreciation, calculating budgets, foreign currencies, and basic taxation on goods and services.</p> <p>I have developed my understanding of finance in personal, local and global contexts.</p> <p>I can model problems, using expressions and equations involving symbols or words to represent unknown values, adopting the conventions of algebra. I can use inverse operations to find unknown values in simple equations.</p>	<p>Convert between currencies</p> <p>Calculate the product of a pair of any fractions</p> <p>Calculate dividing an integer by a non-unit fraction</p> <p>Calculate dividing a fraction by a unit fraction</p> <p>Use reciprocals</p> <p>Calculate dividing any pair of fractions</p> <p>Calculate multiplying and dividing improper and mixed fractions</p> <p>Calculate multiplying and dividing algebraic fractions</p>
Advancing	<p>I have extended my understanding of multiplicative reasoning to include the concept and application of ratio, proportion and scale.</p> <p>I can fluently recall multiplication facts up to at least 10 x 10 and use these to derive related facts.</p> <p>I can demonstrate an understanding of the idea of input, application of a rule (including inverse operations) and output, using a function machine or other appropriate methods, and I have applied this idea to solve problems.</p>	<p>Compare ratios and related fractions</p> <p>Express ratios in the form 1:n</p> <p>Explore conversion graphs</p> <p>Explore direct proportion graphs</p> <p>Explore relationships between similar shapes</p> <p>Use scale factors as multiplicative representations</p> <p>Draw and interpret scale diagrams</p> <p>Interpret maps using scale factors and ratios</p>



		<p>Calculate multiplying a fraction by an integer</p> <p>Calculate the product of a pair of unit fractions</p> <p>Calculate dividing an integer by a unit fraction</p>
Securing	<p>I am beginning to understand that unit fractions represent equal parts of a whole and are a way of describing quantities and relationships.</p> <p>I can use my understanding of multiplication to recall some multiplication facts and tables starting with tables 2, 3, 4, 5 and 10 and I can use the term 'multiples'.</p> <p>I have explored and can use my understanding of multiplicative relationships to multiply and divide whole numbers, using a range of representations, including sharing, grouping and arrays.</p> <p>I have experienced and explored simple multiplicative relationships that allow me to discuss the properties of number, including factors, multiples, prime and square numbers.</p>	<p>Solve problems involving ratios of the form 1:n (or n:1)</p> <p>Solve proportional problems involving the ratio m:n</p> <p>Calculate dividing a value into a given ratio</p> <p>Express ratios in their simplest integer form</p> <p>Solve problems involving direct proportion</p> <p>Represent multiplication of fractions</p>
Beginning	<p>I can use mathematical language to describe quantities, and to make estimates and comparisons such as 'more than', 'less than' and 'equal to'.</p> <p>I have explored forming a quantity in different ways, using combinations of objects or quantities.</p> <p>I have experienced grouping and sharing with objects and quantities, and I can group or share small quantities into equal-sized groups.</p>	<p>Use different ways to represent the ratio.</p> <p>Use ratio notation.</p>

Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
<p>Local links: Explore how the school distributes its budget to the benefit of the students.</p> <p>National links: Using Welsh Government figures, examine how the Senedd distributes its UK grant between different departments.</p> <p>International links: Review government expenditure on defence to explore how the nuclear option affects overall spending.</p>	<p>Cross-curricular Links: Food: uses Direct Proportion when altering the ingredients for recipes. Product Design: use scale diagrams and ratio when modelling ideas.</p> <p>DCF: Cross curricular project incorporating numerous DCF skills embedded at the end of Summer term.</p> <p>Literacy: Frayer models and key word spelling tests will assist learners with tier 3 vocabulary. Reasoning and logic will be tested using additional constraints and higher order questioning.</p>

Assessment (How will we know that students have learnt what we taught them?)	
<p>Formative assessment: Teacher circulating Cold calling</p>	<p>Summative assessment: Open book assessment covering all topics.</p>



Mini whiteboards Peer/self assessment tasks Pickers Desmos Mathswatch	
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Evaluation Evaluation (To be completed 2024)

Strengths	Areas for Development	Pupil Voice