Big Question - Developing number sense

AoLE: Mathematics and Numeracy	Subject: Maths	Year: 7

Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
How can I apply appropriate methods to calculations?	Pupils will gain an appreciation for the importance of mental calculations. The pupils will focus on methods of completing mental calculations for integers, decimals and fractions. The pupils will begin to understand how using known facts can assist in mental calculations. The application of estimation methods to check the accuracy of their mental calculations. The pupils will also realise when it will be appropriate to use mental strategies, formal written methods or use a calculator.	Four arithmetic operations. Integers. Decimals. Estimation. Factors. Formal methods of arithmetic. Fractions.

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

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression (Blooms) / Knowledge
Excelling	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. I can fluently recall multiplication facts up to at least 10 x 10 and use these to derive related facts. I can verify calculations and statements about number by inverse reasoning and approximation methods. I can use a range of representations to extend my understanding of the number system to include negative values, decimals and fractions. I can accurately place integers, decimals and fractional quantities on a number line. I can apply my understanding of number value to round and approximate appropriately.	Calculate mental decimal addition up to 2 decimal places. Calculate mental decimal subtraction up to 2 decimal places. Calculate mental decimal multiplication of decimals by decimals up to 2 decimal places . Calculate mental division of decimals up to 2 decimal places by integers. Calculate rounding decimals to 1 decimal place. Calculate arithmetic of unit fractions. Calculate estimates using rounding to check answers. Apply estimation methods to check the accuracy of answers.
Advancing	I can fluently apply the four arithmetic operations in the correct order with integers, decimals and fractions, consolidating my understanding of reciprocals when dividing fractions. I can recall multiplication facts up to at least 10 x 10 and use these to derive related facts. I can verify calculations and statements about number by inverse reasoning.. I can extend my understanding of the number system to include negative values, decimals and fractions. I can accurately place integers, decimals and fractional quantities on a number line. I can apply my understanding of number value to round and approximate appropriately.	Calculate mental decimal addition up to1 decimal place. Calculate mental decimal subtraction up to 1 decimal place. Calculate mental decimal multiplication of decimals by decimals up to 1 decimal place . Calculate mental division of decimals up to 1 decimal place by integers. Calculate rounding decimals to whole numbers. Calculate estimates using rounding to check answers. Apply estimation methods to check the accuracy of answers.

| Securing | I can fluently recall multiplication facts up to at least 10 x 10 and use these to derive related facts.

I am beginning to estimate and check the accuracy of my answers, using inverse operations when appropriate.

I have experienced and explored simple multiplicative relationships that allow me to discuss the properties of number, including factors, multiples, prime and square numbers.

I have explored additive relationships, using a range of representations. I can add and subtract whole numbers, using a variety of written and mental methods.

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'.

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. | Calculate mental integer addition up to three digits.

Calculate mental integer subtraction up to three digits.

Calculate mental integer multiplication up to two digit by two digit.

Calculate mental division of a two digit integer by one digit integer.

Calculate rounding integers to the nearest power of 10 (10, 100, 1000, etc).

Calculate estimates using rounding to check answers.

Apply estimation methods to check the accuracy of answers. |
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| Beginning | I can use mathematical language to describe quantities, and to make estimates and comparisons such as 'more than', 'less than' and 'equal to'.

I can read, write and interpret larger numbers, up to at least 1000, using digits and words.

I have explored additive relationships, using a range of representations. I can add and subtract whole numbers, using a variety of written and mental methods.

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'.

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. | Describe integer numbers up to 100 written in figures as words.

Describe integer numbers up to 100 written in words as figures.

Calculate mental integer addition up to two digits.

Calculate mental integer subtraction up to two digits.

Calculate mental integer multiplication up to one digit by two digit.

Calculate mental division of a two digit integer by one digit integer.

Apply known multiplication facts to derive other multiplications.

Explore known multiplication facts and their link to division.

Explore estimation of integers and decimals. |

Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
Local links:
Write and describe local population numbers in figures and words.

National links:
Discover how immigration is affecting the Welsh population and the financial impact of increasing numbers of immigrants and refugees.

International links:
Explore the effects of climate change on the economic prospects of key countries most at risk of significant upheaval due to rising sea levels. | Cross-curricular Links:
Music uses fraction arithmetic in the musical beats.
Science uses mathematical language to describe relationships.
Food and nutrition uses arithmetic to calculate the required ingredients.
Product design uses arithmetic to calculate dimensions.
IT uses multiplication when describing pixels and scaling images.
PE uses arithmetic to extrapolate timings.

DCF: Desmos to investigate relationships between angles.

Cross curricular project incorporating numerous DCF skills embedded at the end of Spring term. |

	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.

Assessment (How will we know that students have learnt what we taught them?)	
Formative assessment: Teacher circulating. Cold calling. Mini whiteboards. Peer/self assessment tasks. Plickers. Desmos.	Summative assessment: Open book assessment covering all topics.

Evaluation Evaluation (To be completed July 2024)		
Strengths	Areas for Development	Pupil Voice