

HIAS MOODLE+ RESOURCE

Year 6 Unit Plan 6.5

Autumn Term

HIAS Maths Team
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Final Version

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Overview

In this document

Year 6 Unit Plans linked to Medium Term Overview

Points to consider when using this resource

These unit plans provide an example of how medium term planning could be developed into units of work. These unit plans will need to be adapted to meet the needs of pupils. The unit plan provides an outline of a possible learning journey with suggestions of types of tasks that could be used. They also identify key prior learning, some common misconceptions and an indication of number fluency pupils need to develop towards automaticity. It is assumed that pupils will have access to appropriate concrete resources to support conceptual understanding and that teachers will use a CPA (concrete, pictorial and abstract) approach to teaching.

Year 6 – Unit 6.5 – Number and Place value, mass and capacity and all four operations

This unit is about developing number sense in the context of mass and capacity. Pupils will begin to learn about algebraic expressions and apply this understanding to real life contexts. The numberline will be used to make estimations and pupils will use factors and prime factors to multiply. Throughout this unit, pupils will be required to mathematically reason with clear models being demonstrated to support understanding.

Session	Unit Objectives	Types of task
1-10	• Round any whole number to a required degree of accuracy • Identify the value of each digit to three decimal places and multiply and divide numbers by 10,100 and 1000 where the answers are up to three decimal places. • Solve problems involving the calculation and conversion units of measure (g/kg ; ml/l) using decimal notation up to three decimal places .Link to place value understanding of scaling up and down by 1000 ($\times / \div$) • Use, read, write and convert between standard units, converting measurements of mass and capacity from a smaller unit of measure to a larger unit and vice versa. • Estimate capacity using standard units to measure liquid (l/ml) and read scales graded in different sized steps (e.g. 0,10,20,30.... 0 , 25 , 50 , 75.... 0, 20, 40,60...) • Understand and use equivalences between metric units and common imperial units such as pounds and pints.	Initial task: 5 boxes of toy cars weighed a total of $1\frac{1}{4}$Kg. A box containing a toy lorry weighed double the amount of a box containing a toy car. What is the weight of a box containing a toy lorry? Pictorial diagrams Use the bar model and numberline to represent the problem. On a numberline mark points of weight such a $\frac{1}{4}$ of a kg, $\frac{1}{2}$ a kg and include the gram conversion. What is 125 grams? This is an $\frac{1}{8}$ of a Kg and the same as 0.125kg. Share similar facts such as this. Focus on multiplying and dividing numbers by 10, 100 and 1000. Include conversions such as $0.23\text{kg} = \underline{\hspace{2cm}}$ g? where there is a place holder missing. Complete a similar process for capacity using the bar model and the numberline – <i>A bucket can be filled by a 750ml measuring jug by filling the jug $5\frac{1}{2}$ times. How much water does the bucket hold?</i> Estimating Teach pupils that when estimating, refer to real life examples such as 1 bag of sugar is 1kg and a 2-litre bottle, a can of coke holds 330ml. If I asked you to estimate how much a mug holds, think carefully about the real-life examples that you know such as a can of coke. Use this information to make a reasonable estimation. Teach pupils equivalences using metric units and common imperial units. Include approximations such as $8\text{km} = 5$ miles and ask questions accordingly. Problem solving: <i>Mary walked 27 and $\frac{1}{2}$ miles. How far did Mary walk in km?</i> Use the numberline to demonstrate how miles can be converted into km by showing that for every jump of 5 there is 8km. What do we know about the $2\frac{1}{2}$ miles remaining?

11-15	• Use knowledge of the order of operations to carry out calculations involving the four operations • Know that distributivity can be expressed as $a(b + c) = ab + ac$. (e.g. $13 \times 8 = 8(10 + 3)$) • Understand the terms factor, multiple and prime, square and cube numbers and use them to construct equivalence statements (for example, $4 \times 35 = 2 \times 2 \times 35$; $3 \times 270 = 3 \times 3 \times 9 \times 10 = 92 \times 10$). • Identify common factors, common multiples and prime numbers. • Express missing number problems algebraically • Find pairs of numbers that satisfy pairs of numbers involving two unknowns • Solve problems involving addition, subtraction, multiplication and division, deciding which operations and methods to use and why • Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.	Recap the terminology from Year 5 and unit 6.2 including factors, square numbers, prime numbers and prime factors. Investigative questions such as: <i>'the factors in a number totalled 24. What could the number be?'</i> Pictorial representations – Use the numberline to help pupils identify the factor pairs and understand when they have identified all the factors of a number. Use the bar model to demonstrate that not all numbers have an even number of factors making the link with square numbers. Solving calculations Give pupils calculations such as $21 \times 42 = ?$ Identify the factors and understand how this could be rewritten as $7 \times 3 \times 6 \times 7 =$. Now encourage pupils to identify the prime factors and that this could also be rewritten as $7 \times 3 \times 2 \times 3 \times 7 =$ Reason about the order of the numbers and where the starting point may be.... <i>I would reorder the number sentence so that I start with 7×7 first as I know this times table fact, however multiplying by 7 with larger numbers could prove tricky.</i> <i>I would reorder this to be $7 \times 7 \times 3 \times 3 \times 2 =$ as I would end with multiplying by 2 as this is simply doubling.</i> Encourage pupils to use the language of common multiples and factors as they are looking at different stages. Missing number problems: Show pupils the following style questions: $25 \times \underline{\quad} = 34 + \underline{\quad}$ <i>What does the equal sign mean within this number sentence? What could the answer be? Is there more than one? What else may the answer be? – Develop the systematic approach.</i> Mathematical reasoning: What can you tell me about the number that will complete the addition number sentence? <i>The ones column for the missing number will always be a 1 or a 6 as all multiples of 25 end in 0 or 5.</i> Algebra: Begin to look at how maths can be expressed algebraically. $a + b = c$. $c \div 8 = 2.5$. <i>What is the value of c? What could the value of a and b be?</i> $3x = 21$. What is the value of x? Give pupils simpler equations to understand that numbers can be replaced with letters and then build upon their learning to more complex tasks such as $3x + 3y = 13.5$. <i>If $y = 4$, what is the value of x?</i>
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Check and refresh	Watch out for...	Building fluency
The vocabulary of factors, multiples, square numbers, prime numbers and prime factors. Units of measure and converting units of measure. The equal sign within a number sentence can be in different places and what the equal sign represents.	Pupils understanding of decimals in the context of measure – what does 0.45kg equal in terms of grams? Use a place value chart to discuss conversion further. Pupils understanding of prime numbers and that 1 is not a prime number because it does not consist of two factors.	Multiplying and dividing by 10, 100 and 1000 including numbers with up to 3 decimal places. Make links with units of measure and fractions – $\frac{1}{4}$ of litre = 250ml. $\frac{1}{10}$ of a km = 100ml. Knowing factors and multiples of all numbers within the 12 x 12 times tables and applying this knowledge to multiples of the same number – because I know $6 \times 6 = 36$, I also know $60 \times 6 = 360$ and I also know that $0.6 \times 60 = 36$.

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