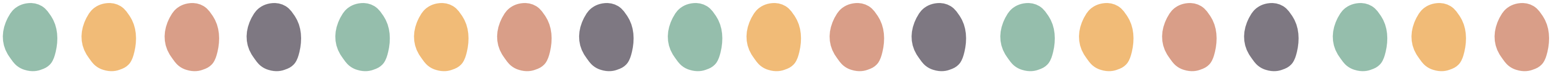


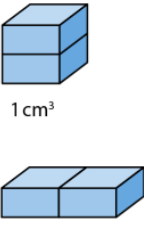
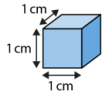
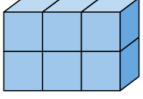
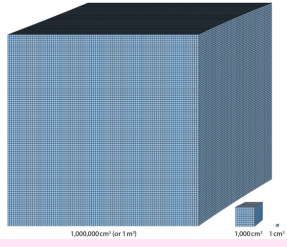
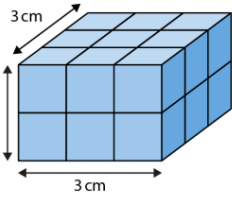
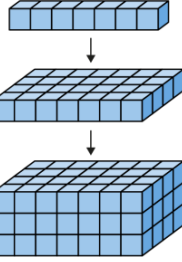
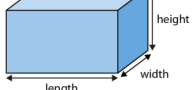
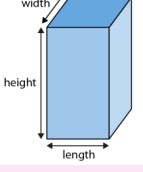
Y5- Overview

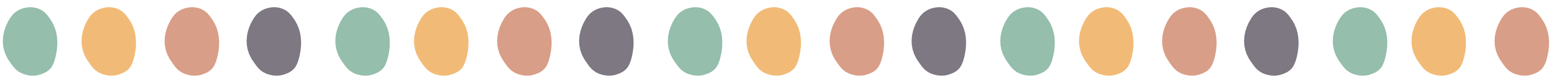
	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1		Summer 2	
Unit	1	2	3	4	5		6	7	8	9	10	

	Number and place value
	Number facts
	Addition and subtraction
	Multiplication and division
	Fractions
	Geometry
	Other

Spring 2	Understand the concept of volume (1 week)
Ready to progress	MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.
NCETM documents	TEACHING POINT 1, 2 AND 3 https://www.ncetm.org.uk/media/z04i4d5q/ncetm_spine2_segment20_y5pdf#page=4
Small steps	- To explain what volume is in a range of contexts. - To describe the units used to measure volume. - To explain how to calculate the volume of a cuboid and a cube. - To explain how to calculate the volume of compound shapes. - To use knowledge of calculating volume to solve problems in a range of contexts.
Links	NCETM TO SLIDE 40- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fqm0d04is%2Fcp-year-5-unit-7-factors-multiples-and-primes.pptx&wdOrigin=BROWSELINK OAK https://www.withnationalacademy/teachers/programmes/maths-primary-ks2/units/understand-the-concept-of-volume/lessons?sid-ca872l=EeE3dERxAU&sm=0&src=3 WHITE ROSE https://whiteroseeducation.com/account/resources Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgw/mastery_assessment_y5pdf
Reasoning	Top Tips Put these volumes in order starting with the largest: 13000 cm ³ , 1.2 m ³ , 13 l Explain your thinking. Undoing: A container is completely full and holds 4.8 litres of juice. Someone poured in 1.2 litres more to fill it. How much juice was in the container before? Write More Statements Mr Smith has boxes with a volume of 60 cm ³ . He also has smaller cubes with a volume of 15 cm ³ each. Write some different ways he could combine the cubes to fill a box. Always, Sometimes, Never Is it always, sometimes, or never true that: When you double the length of a cuboid, its volume also doubles? Explain with examples. Working Backwards Put these volumes in order starting with the greatest: 4500 cm ³ 5.1 litres 0.005 m ³ Explain your thinking. The Answer Is... The answer is 720 cm ³ . What could the question be? Try to come up with at least two different questions involving volume that could lead to this answer. What Do You Notice? What do you notice? 1 litre = 1000 cm ³ 1000 ml = _____ Can you find another set of equivalent volume facts? Fill in the Missing Fill in the missing volumes: 1 m ³ = _____ litres 1 litre = _____ cm ³ 0.5 litres = _____ ml



	Understand the concept of volume (1 week)
Problem solving	 Click on me
Glossary	• Volume - The amount of 3-dimensional space something takes up is called its volume. • Space - The place in which objects exist is known as its space. • Mass - The measure of how much matter is in an object is known as its mass. • Cubic centimetre - A cubic centimetre is volume that is made by a cube that is 1 centimetre on each edge. • Cubic metre - A cubic metre is volume that is made by a cube that is 1 metre on each edge. • Cube number - A cube number is the product of three repeated whole numbers. • Deduce - If we use existing facts and logic to help find new facts, we can say that we have deduced the new fact. • Dimension - A dimension is the measurement of an edge in one direction. For example: length, width or height of a 3D shape are dimensions.
Stem sentences	Introduce the term 'volume' using the following stem sentence: 'The amount of space the ____ takes up is its volume'. Encourage children to use the following stem sentence to compare objects: 'The ____ has a larger volume than the ____'. Use the following stem sentence to describe the objects: 'The ____ has a larger volume than the ____ because it occupies more space.' Work towards the following generalised statement: 'You can measure volume in cubic centimetres. You write this as "cm³".' This shape has a volume of _____ cm³. You can measure volume in cubic metres. You write this as "m³". This layer has ____ rows of cubes.' There are ____ 1 cm³ cubes in this layer.' 'This layer has a volume of ____ cm³.' 'There are ____ layers of ____ cm³.' 'The volume of the cuboid is ____ cm³' Use the following generalised statement: 'The volume of a cuboid can be found by multiplying the length by the width by the height.' If you change the order of the factors, the product remains the same.' When we multiply three numbers, the product will be the same whichever pair we multiply first.'
Representations	Two shapes with a volume of 1 cm³:  1 cm³ 1 cm³  1 cm 1 cm 1 cm volume = 1 cm³  6 cm³ • 'This shape has a volume of 6 cm³.'  1000 cubes (1 m³) 1000 cm³ = 1 m³ Step 1 – working out the volume of one layer:  • 'This layer has three rows of three cubes.' • $3 \times 3 = 9$ • 'So there are nine 1 cm³ cubes in this layer.' • 'This layer has a volume of 9 cm³.' Step 2 – adding the layers together: • 'There are two layers of 9 cm³.' • $9 \times 2 = 18$ • 'The volume of the cuboid is 18 cm³.' Finding the volume of a complete cuboid: 'What is the volume of this cuboid?'  3 cm 3 cm 2 cm $3 \text{ cm} \times 3 \text{ cm} \times 2 \text{ cm} = 18 \text{ cm}^3$ • 'The volume of the cuboid is 18 cm³.' Building up layers to find the volume: 'What is the volume of this cuboid?'  $7 \text{ cm} \times 4 \text{ cm} \times 3 \text{ cm} = 84 \text{ cm}^3$ • 'The volume of the cuboid is 84 cm³.' Finding the volume of a cuboid:  length width height  width height length

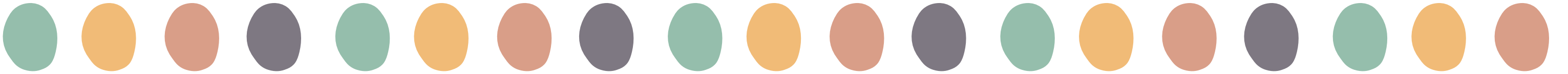


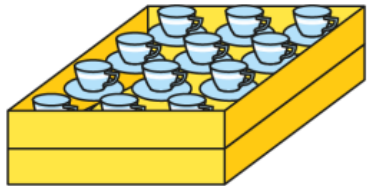
Y5- Overview

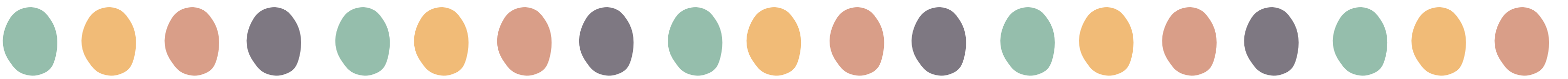
	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1	Summer 2	
Unit	1	2	3	4	5		6	7	8	9	10

	Number and place value
	Number facts
	Addition and subtraction
	Multiplication and division
	Fractions
	Geometry
	Other

Spring 2	Multiply 3 or more numbers (commutative and associative laws) (1 week)
Ready to progress	MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.
NCETM documents	TEACHING POINT 4 and 5 https://www.ncetm.org.uk/media/z04i4d5q/ncetm_spine2_segment20_y5.pdf#page=4
Small steps	- To explain the use of the commutative and associative laws when multiplying three or more numbers. - To apply the commutative and associative laws to simplify multiplications of three or more numbers. - To explain the reasons for changing two-factor multiplication calculations to three-factor calculations. - To apply the commutative and associative laws to simplify volume calculations. - To apply the commutative and associative laws to simplify problems in a range of contexts.
Links	NCETM slide 40 TO 47- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fqm0d04is%2Fcp-year-5-unit-7-factors-multiples-and-primes.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/multiply-3-or-more-numbers-commutative-and-associative-laws/lessons?sid-9221d9=UezwOcPcjE&sm=0&src=3 WHITE ROSE https://whiteroseeducation.com/account/resources Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgr/mastery_assessment_y5.pdf
Reasoning	Always, Sometimes, Never? - Is it always, sometimes or never true that you get the same answer when you multiply three numbers in any order? - Is it always, sometimes or never true that using brackets in multiplication changes the result? - Is it always, sometimes or never true that the commutative law applies to all operations? - Is it always, sometimes or never true that changing the order of factors helps simplify a multiplication? Use the Inverse - Use the inverse to check if the following is correct: $(4 \times 3) \times 5 = 60$ $(4 \times 3) \times 5 = 60$ $(4 \times 3) \times 5 = 60$ - What division calculation can you use to verify? - Use the inverse to check this simplified calculation using the associative law: $6 \times (5 \times 2) = 60$ $6 \times (5 \times 2) = 60$ $6 \times (5 \times 2) = 60$ - Break it down using inverse operations and explain if it's accurate. Size of an Answer - The product of three whole numbers is about 2,400. - What could the numbers be if you use grouping or reordering to simplify the multiplication? - You are calculating the volume of a cuboid with sides measured in whole numbers. - The volume is approximately 960 cm³. - What could the dimensions be, and how could you use commutative or associative reasoning to simplify your working?



	Multiply 3 or more numbers (commutative and associative laws) (1 week)
Problem solving	 Click on me
Glossary	- Commutative - The commutative law states that you can write the values of a calculation in a different order without changing the calculation; the result is the same. It applies for addition and multiplication. - Associative - The associative law states that it doesn't matter how you group or pair values (i.e. which we calculate first), the result is still the same. It applies for addition and multiplication. - Efficient - Working efficiently means finding a way to solve a problem quickly whilst also maintaining accuracy. - Array - An array is when items are arranged in rows and/or columns. - Factor - Factors are whole numbers which exactly divide another whole number. - Represent - To represent something is to show it in a different way.
Stem sentences	The _____ refers to the _____. If you change the order of the factors, the product remains the same.' When we multiply three numbers, the product will be the same whichever pair we multiply first.'
Representations	'If we stack up two trays, how many teacups will there be in total?'  'One tray has three columns and four rows. There are two trays. We can write this as $3 \times 4 \times 2$.' 'The "3" refers to the number of columns.' 'The "4" refers to the number of rows.' 'The "2" refers to the number of trays.' $3 \times 4 \times 2 = 12 \times 2$$= 24$

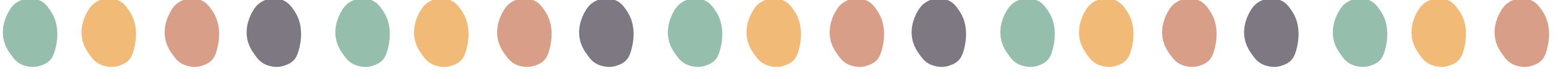


Y5- Overview

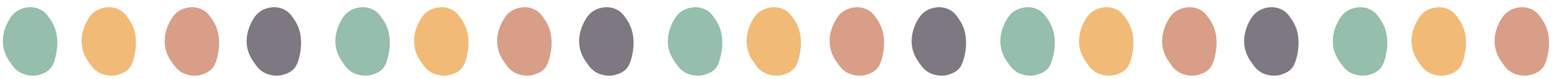
	Autumn 1		Autumn 2		Spring 1	Spring 2		Summer 1	Summer 2	
Unit	1	2	3	4	5	6	7	8	9	10

	Number and place value
	Number facts
	Addition and subtraction
	Multiplication and division
	Fractions
	Geometry
	Other

Spring 2	Understand and use the concept of factorisation (square and prime numbers) (1 week)
Ready to progress	MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.
NCETM documents	TEACHING POINT 1,2,3 and 4 https://www.ncetm.org.uk/media/vfzeuuie/ncetm_spine2_segment2Ly5.pdf#page=4
Small steps	- To explain what a factor is and find factors using arrays and multiplication and division facts. - To explain how to find all the factors of a number systematically. - To use a complete list of factors to explain when a number is a square number. - To explain how to identify a prime number or a composite number. - To explain how to identify a prime factor of a number.
Links	NCETM slide 47 to 79- https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fqm0d04is%2Fcp-year-5-unit-7-factors-multiples-and-primes.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/understand-and-use-the-concept-of-factorisation-square-and-prime-numbers/lessons?sid-9fd879=yBYbyZrcmL&sm=0&src=3 WHITE ROSE https://whiteroseeducation.com/account/resources Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgv/mastery_assessment_y5.pdf
Reasoning	Missing Numbers 6 × 0.9 = ____ × 0.03 - What number goes in the box? Can you explain your reasoning using factor relationships? 6 × 0.04 = 0.008 × ____ - Use your understanding of multiplication facts and inverse operations to find the missing number. Making Links - Apples weigh about 170g each. How many apples would you expect to get in a 2 kg bag? - Use factors and estimation to explain your reasoning. 7 × 8 = 56 - How can you use this known fact to help you solve: 0.7 × 0.8 5.6 ÷ 8 - What patterns or factor links can you identify? Use a Fact 3 × 75 = 225 - Use this to calculate: 450 ÷ 6 225 ÷ 0.6 - How did you use multiplication and factor knowledge to solve these? - To multiply by 25, you multiply by 100 then divide by 4. - Use this method to solve: 48 × 25 78 × 25 4.6 × 25 - Can you explain how you used factors in your strategy? Prove It - What goes in the missing box? 12 3 ÷ 6 = 212 12 3 ÷ 7 = 212 22 3 ÷ 7 = 321 r 6 323 × ____ = 13243 - Prove your answers. Use factor or divisibility reasoning where you can.



	Understand and use the concept of factorisation (square and prime numbers) (1 week)																						
Problem solving	 Click on me																						
Glossary	- Row - Objects lying side by side in a horizontal line is known as a row. - Column - A column is an arrangement of objects one above the other in a vertical line. - Array - An array is when items are arranged in rows and/or columns. - Factor - Factors are whole numbers which exactly divide another whole number. - Product - The product is the result of two numbers (factors) multiplied together. - Systematic - Being systematic, means working in a set way, often according to a fixed plan. - Square number - A square number is the result of multiplying an integer (not a fraction) by itself - Factor - A factor is a whole number which exactly divides another whole number. - Prime factor - A prime factor is a factor of a number that is a prime number.																						
Stem sentences	There are _____ tiles. There are _____ rows and _____ columns. So _____ and _____ are factors of _____. '1 is a factor of all positive integers.' Every positive integer is a factor of itself' The smallest factor of a positive integer is always "1". The largest factor of a positive integer is always itself' Numbers that have more than two factors are composite numbers. Numbers that have exactly two factors are called prime numbers.																						
Representations	When "1" is a factor, the product is equal to the other factor.' <table><tr><td>1</td><td></td><td>$1 \times 1 = 1$</td></tr><tr><td>2</td><td></td><td>$2 \times 1 = 2$</td></tr><tr><td>3</td><td></td><td>$3 \times 1 = 3$</td></tr><tr><td>4</td><td></td><td>$4 \times 1 = 4$</td></tr></table> Identifying prime numbers using arrays: Which of these are square numbers? Recording factors: <table><tr><th>Number</th><th>Factors</th></tr><tr><td>6</td><td>1, 2, 3, 6</td></tr><tr><td>7</td><td>1, 7</td></tr><tr><td>8</td><td>1, 2, 4, 8</td></tr><tr><td>14</td><td>1, 2, 7, 14</td></tr></table> Using factor bugs to find factors:	1		$1 \times 1 = 1$	2		$2 \times 1 = 2$	3		$3 \times 1 = 3$	4		$4 \times 1 = 4$	Number	Factors	6	1, 2, 3, 6	7	1, 7	8	1, 2, 4, 8	14	1, 2, 7, 14
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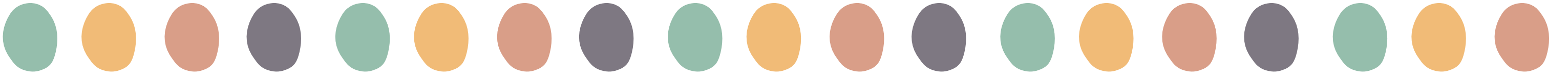


Y5- Overview

	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1	Summer 2	
Unit	1	2	3	4	5		6	7	8	9	10

	Number and place value
	Number facts
	Addition and subtraction
	Multiplication and division
	Fractions
	Geometry
	Other

Spring 2	Use common factors and multiples to solve calculations efficiently (1 week)
Ready to progress	MD-2 Find factors and multiples of positive whole numbers, including common factors and common multiples, and express a given number as a product of 2 or 3 factors.
NCETM documents	TEACHING POINT 5 AND 6 https://www.ncetm.org.uk/media/vfzeuuie/ncetm_spine2_segment2Ly5.pdf#page=4
Small steps	- To explain how to identify common factors between two or more numbers. - To explain how to identify a common multiple of two or more numbers. - To use knowledge of properties of number to solve problems. - To explain how to use the factor pairs of 100 to solve calculations efficiently. - To use properties of numbers and the commutative and associative laws to simplify calculations.
Links	NCETM 79 TO THE END -https://view.officeapps.live.com/op/view.aspx?src=https%3A%2F%2Fwww.ncetm.org.uk%2Fmedia%2Fqm0d04is%2Fcp-year-5-unit-7-factors-multiples-and-primes.pptx&wdOrigin=BROWSELINK OAK https://www.thenationalacademy/teachers/programmes/maths-primary-ks2/units/use-common-factors-and-multiples-to-solve-calculations-efficiently/lessons?sid-749526=sJNP1l0jad&sm=0&src=3 WHITE ROSE https://whiteroseeducation.com/account/resources Mastery with greater depth https://www.ncetm.org.uk/media/lp0o2lgr/mastery_assessment_y5.pdf
Reasoning	Missing Numbers $6 \times 0.9 = \text{___} \times 0.03$ What number goes in the box? Can you explain your reasoning using factor relationships? $6 \times 0.04 = 0.008 \times \text{___}$ Use your understanding of multiplication facts and inverse operations to find the missing number. Making Links Apples weigh about 170g each. How many apples would you expect to get in a 2kg bag? Use factors and estimation to explain your reasoning. $7 \times 8 = 56$ How can you use this known fact to help you solve: 0.7×0.8 $5.6 \div 8$ - What patterns or factor links can you identify? Use a Fact $3 \times 75 = 225$ Use this to calculate: $450 \div 6$ $225 \div 0.6$ - How did you use multiplication and factor knowledge to solve these? To multiply by 25, you multiply by 100 then divide by 4. Use this method to solve: 48×25 78×25 4.6×25 - Can you explain how you used factors in your strategy? Prove It What goes in the missing box? $12\ 3 \div 6 = 212$ $12\ 3 \div 7 = 212$ $22\ 3 \div 7 = 321\ r6$ $323 \times \text{___} = 13243$



	Use common factors and multiples to solve calculations efficiently (1 week)																																																																																																				
Problem solving	 Click on me																																																																																																				
Glossary	- Factor - A factor is a whole number which exactly divides another whole number. - Common factor - When we compare lists of factors of two or more numbers, any factors that are the same are common factors. - Prime factor - A prime factor is a factor of a number that is a prime number. - Multiple - A multiple is the result of multiplying a number by an integer (not by a fraction). - Common multiple - A common multiple is a multiple that is common to two or more numbers. - Property - A property is a character or quality that something has. - Classify - When you classify objects, you arrange the objects by some property. - Associative - The associative law states that it doesn't matter how you group or pair values (i.e. which we calculate first), the result is still the same. It applies for addition and multiplication.																																																																																																				
Stem sentences	is a factor of ____ because is a multiple of ____ because is a factor of ____ because is a multiple of ____ because																																																																																																				
Representations	Factors and multiples: 2 3 "2" is a factor of "6" because $2 \times 3 = 6$ "6" is a multiple of "2" because $2 \times 3 = 6$ "2" is a factor of "6" because $6 \div 3 = 2$ "6" is a multiple of "2" because $6 \div 2 = 3$ • 'Use a hundred square to find the common multiples of "3" and "5".' <table><tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr><tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr><tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr><tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr><tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr><tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr><tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr><tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr></table>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
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