Unit Overview and Guidance

- The exemplification has been taken from the NCETM Resource Toolkit, with additions in order to ensure full coverage.
- White Rose planning links (with questions categorised into the three aims of the national curriculum i.e. fluency, problem solving and reasoning) are hyperlinked to each of the objectives.
- NCETM reasoning questions have been incorporated and are identified in pale purple boxes
- The 'big Ideas' sections from the NCETM 'Teaching for Mastery' documents have been included at the start of each unit. Hyperlinks to the full NCETM 'Teaching for Mastery' documents have also been included for easy reference.
- Hyperlinks to NRich activities have also been added to this version. These are found by clicking on the blue buttons like this one [1] at the bottom of relevant objective.
- Some additional content has been added in order to support mixed-aged planning. Any additional content is in italics and strikethrough has been used to identify when an objective has been altered.
- Each unit is sub-divided into sections for ease of planning. Sub-categories in this unit are;
    1. Multiplication and division
    2. Derive and recall x÷
    3. Checking
    4. Solving Problems

	Reception	Yr1	Yr2	Yr3
NCETM Teaching for Mastery Questions, tasks and activities to support assessment	**The Big Ideas** *Numbers (Early Learning goals)* They solve problems, including doubling, halving and sharing.	**The Big Ideas** Counting in steps of equal sizes is based on the big idea of 'unitising' ; treating a group of, say, five objects as one unit of five. Working with arrays helps pupils to become aware of the commutative property of multiplication, that 2 × 5 is equivalent to 5 × 2.	The Big Ideas It is important that pupils both commit multiplication facts to memory and also develop an understanding of conceptual relationships. This will aid them in using known facts to work out unknown facts and in solving problems. Pupils should look for and recognise patterns within tables and connections between them (e.g. 5× is half of 10×). Pupils should recognise multiplication and division as inverse operations and use this knowledge to solve problems. They should also recognise division as both grouping and sharing. The recognition of pattern in multiplication helps pupils commit facts to memory, for example doubling twice is the same as multiplying by four, or halving a multiple of ten gives you the related multiple of five.	**The Big Ideas** It is important for children not just to be able to chant their multiplication tables but also to understand what the facts in them mean, to be able to use these facts to figure out others and to use in problems. It is also important for children to be able to link facts within the tables (e.g. 5× is half of 10×). They understand what multiplication means, see division as both grouping and sharing, and see division as the inverse of multiplication.
	[Becoming a Mathematician](#)	[Teaching for Mastery Year 1](#)	[Teaching for Mastery Year 2](#)	[Teaching for Mastery Year 3](#)

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NUMBER: Multiplication and Division (NMD - 3 weeks)

Strand		Reception	Yr1	Yr2	Yr3
Multiplication and Division	Mental Calculations	***ELG** They solve problems, including doubling, halving and sharing.* **Adult Initiated** **Use Dominos**; *Can you find all the double dominos? What do you notice? Can you make a double domino? Tell me about your double domino.* **Use Numicon shapes to find matching pairs.** **Explain how up to 10 objects can be separated into two groups**, finding different ways of doing it; Find different ways of throwing 5 bean bags one by one *How many went in the bucket? How many missed?* **Plant bulbs**; *How should we plant the daffodil bulbs in these three pots? Is there a way of doing it so that they all have the same number? Are any left over?* **Encourage children to extend problems**; *Suppose there were three people to share the bricks between instead of two* **Enabling Environments –child initiated, adult supported** **Outdoors** **Role play**: in the ice cream shop- be able to buy 'double scoops' Transporting the dolls in double buggies **Indoors** **Snack time routines;** sharing the fruit, crackers etc. **Water area:** sharing 6 frogs between 2 lily pads/ fish between 2 ponds	**count in multiples of twos,** **count in multiples of twos, fives and tens (1)** **count in multiples of twos, fives and tens (2)** Count groups of 10 each of 2p, 5p and 10p coins	**calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and =** Children should be able to: Find missing numbers or symbols in a calculation: 4 x __ = 20 __ ÷ 10 = 3 Anna has 3 boxes of cakes. Each box contains 5 cakes. How many cakes does she have altogether? Show how you worked this out. [1] [2] [3] **show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot** Children should be able to: Use their knowledge of triangles of numbers to show related number facts. e.g. If 6 x 2 = 12 then 2 x 6 = 12 and 12 ÷ 6 = 2.	**write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods** - One orange costs nineteen pence. How much will three oranges cost? Mark drives 19 miles to work every day and 19 miles back. He does this on Mondays, Tuesdays, Wednesdays, Thursdays and Fridays. How many miles does he travel to work and back in one week?
	NCETM Reasoning		**Making links** If one teddy has two apples, how many apples will three teddies have? Here are 10 lego people If 2 people fit into the train carriage, how many carriages do we need? Practical If we put two pencils in each pencil pot how many pencils will we need?	**Making links** Write the multiplication number sentences to describe this array | X	X	X
X	X	X | What do you notice? Write the division sentences. **Prove It** Which four number sentences link these numbers? 3, 5, 15? Prove it.	**Use a fact** 20 x 3 = 60. Use this fact to work out 21 x 3 = 22 x 3 = 23 x 3 = 24 x 3 = **Prove It** What goes in the missing box? | x	?	?
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4	80	12	 Prove it. **How close can you get?** ☐☐ × ☐ Using the digits 2, 3 and 4 in the calculation above how close can you get to 100? What is the largest product? What is the smallest product?

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NUMBER: Multiplication and Division (NMD - 3 weeks)

Derive and Recall x÷	Derive and Recall x÷			*(Year 2 adapted) explore multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers* *Explore multiplication and division using apparatus and model how to represent as an array.*	**recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers** The children should be able to: Recognise a multiple of 2, 5 or 10 and use their knowledge of multiplication facts to find corresponding division facts. They can say which numbers are odd and which are even. e.g. 2 x 5 = 10, show me three more number facts using these numbers. Is 34 an odd number? How do you know? `1` `2` `3` `4` `5` `6` `7` `8`	**recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables** • multiply seven by three; what is four multiplied by nine? Etc. • Circle three numbers that add to make a multiple of 4 11 12 13 14 15 16 17 18 19 • Leila puts 4 seeds in each of her pots. She uses 6 pots and has 1 seed left over. How many seeds did she start with? • At Christmas, there are 49 chocolates in a tin and Tim shares them between himself and 7 other members of the family. How many chocolates will each person get? `1` `2`
	NCETM Reasoning			**Spot the mistake** Use a puppet to count but make some deliberate mistakes. e.g. 2 4 5 6 10 9 8 6 See if the pupils can spot the deliberate mistake and correct the puppet	**Missing numbers** 10 = 5 x ▢ What number could be written in the box? **Making links** I have 30p in my pocket in 5p coins. How many coins do I have? **True or false?** When you count up in tens starting at 5 there will always be 5 units.	**Missing numbers** 24 = ▢ x ▢ Which pairs of numbers could be written in the boxes? **Making links** Cards come in packs of 4. How many packs do I need to buy to get 32 cards? **True or false?** All the numbers in the two times table are even. There are no numbers in the three times table that are also in the two times table.

NUMBER: Multiplication and Division (NMD - 3 weeks)

Checking	Checking				**estimate the answer to a calculation and use inverse operations to check answers** Matthew sys if he has 75 sweets shared by 5 friends, they will each have 17 sweets. Write down a multiplication questions that you could do to check this?
	NCETM Reasoning			**Use the inverse** Use the inverse to check if the following calculations are correct: $12 \div 3 = 4$ $3 \times 5 = 14$	**Use the inverse** Use the inverse to check if the following calculations are correct $23 \times 4 = 82$; $117 \div 9 = 14$ **Size of an answer** Will the answer to the following calculations be greater or less than 80 $23 \times 3 =$ $32 \times 3 =$ $42 \times 3 =$ $36 \times 2 =$
	Solving Problems	*40-60+ months record using marks that they can interpret and explain* *40-60+ months begin to identify own mathematical problems based on own interests and fascinations*	**solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of a teacher** Children should be able to:Use practical apparatus, arrays and images to help solve multiplication and division problems such as: Ben had 5 football stickers. His friend Tom gave him 5 more, how many does he have altogether? Share 12 sweets between two children. How many do they each have? Show children pictures or groups of objects as below. Ask questions such as "How many biscuits are they altogether? "How many cherries are there altogether?" Observe how children count the objects. Do they count in twos, fives etc or do they count in ones? 1 2 3	**solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts** Children should be able to: Use various methods and apparatus to help them solve word problems such as: There are 10 lollies in a bag. Charlie needs 30 lollies for his party. How many bags does he need to buy? Show how you worked this out. 1 2 3 4 5 6 7 8	**solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects** Miss West needs 28 paper cups. She has to buy them in packs of 6 How many packs does she have to buy? Tom is laying tiles. He has 84 tiles; how many complete rows and columns could he make? Fill in the missing digits in these calculations 2☐ 2☐ 1☐4 × 8 × ☐ × ☐ 1 7 6 1 1 2 7 3 6 1 2 3 4 5 6 7
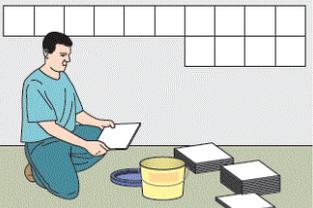
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