Old Town Infant School and Nursery

Coastal Learning PARTNERSHIP

MATHS MEDIUM TERM PLANNING

Year 2 – Multiplication and Division (Approximately 5 weeks)	
Objectives from Progression Document	**recall and use multiplication facts for the 2 times table** **recall and use multiplication facts for the 5 times table** **recall and use multiplication facts for the 10 times table** **understand that multiplication of two numbers can be done in any order (commutative)** **recall and use division facts for the 2 times table** **recall and use division facts for the 5 times table** **recall and use division facts for the 10 times table** **understand division of one number by another cannot be done in any order** start to recognise the inverse relationship between multiplication and division **calculate mathematical statements for multiplication within the tables they know** **write mathematical statements** **using the multiplication (×) and equals (=) signs** **calculate mathematical statements for division within the tables they know** **write mathematical statements using the division (÷) and equals (=) signs** **solve problems involving multiplication and division as above, including problems in contexts** **show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot**
Previous Learning	**double numbers and quantities of objects to 20** **halve numbers and quantities of objects to 10** **calculate simple multiplication and division answers using concrete objects** **calculate simple multiplication and division answers using pictorial representations*** **calculate simple multiplication and division answers using arrays, with the support of the teacher** **solve one-step problems involving multiplication and division as above** ***make connections between arrays, number patterns and counting in twos, fives and tens***
Vocabulary	multiple of times, multiplication, lots of, division, (row, column)
Key fact(s)	To know that equal groups must all have the same amount To know that arrays are made from equal rows and equal columns To know that the x symbol represents multiply To know that doubling is 2 times the number To know that a number is divided by grouping it into equal groups To know that a number is divided by sharing into equal groups To know that the ÷ symbol represents division
Number facts for fluency	Fluency Bee Stage 2: 1 more and 1 less within 20 Make connections - relationship between 1 more/less; ten and a bit structure; fact families; add and subtract 0
DfE Ready to Progress Guidance Pages https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897806/Maths_guidance_KS_1_and_2.pdf	**2MD-1** Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. *Page 69* **2MD-2** Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division) *Page 72*
NCETM Ready to Progress Exemplification https://www.ncetm.org.uk/classroom-resources/exemplification-of-ready-to-progress-criteria/	**2MD-1** Multiplication as repeated addition **2MD-2** Grouping problems missing factors and division
Problem Solving and Reasoning Skills Objectives	apply their increasing knowledge of mental and written methods use multiplication and division methods as needed, e.g. arrays, repeated addition, mental methods and facts.
Pre-assessment:	Year one multiplication and division – doubles and halves within 20; simple multiplication and division using arrays and concrete materials

Old Town Infant School and Nursery

Coastal Learning PARTNERSHIP

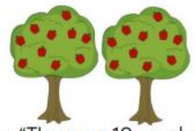
MATHS MEDIUM TERM PLANNING

Sequence of Learning

White Rose Small Steps	Learning Intention	Key Questions	Sentence Stems	Problem-solving links	Comments
Recognise equal groups	To identify equal groups	Are the groups equal or unequal? How do you know? How can you make the groups equal? How many groups are there? How many are in each group? What is the same and what is different about these two pictures? Do all equal groups look the same?	There are ___ equal groups. There are in ___ each group. There are ___groups of___ There are ___ altogether. The groups are equal/unequal because ...	Heads and Feet (maths.org) Trial and improvement; being systematic.	Children may try to find the total instead of finding the amount in each group. Children may not realise that two groups are equal if they do not look the same
Make equal groups	To recognise and make equal groups	Are the groups equal? How do you know if a group is equal or not equal to another group? How can you make these groups equal? How many equal groups can you put these counters into? Can you draw groups of ___? How are 4 groups of 3 different from 3 groups of 4?	There are ____equal groups with ____ in each group There are _____ in each group There are _____ equal groups		Children should be able to represent, for example, 4 groups of 3 as well as 3 groups of 4 accurately and know what is the same and what is different about the two forms. This could be a good opportunity to explore the idea of commutativity. Children may represent a set of equal groups incorrectly, for example 2 groups of 4 instead of 4 groups of 2
Add equal groups	To use repeated addition to add equal groups	How do you know the groups are equal? How many equal groups are there? How many are in each group? Can you write this as an addition sentence? Which number sentence matches the picture?	There are 3 equal groups with ___ in each group. There are 3 groups of ____ ___ + ___ + ____ = ___ There are equal groups with ___in each group. There are ___ groups of ___ There are ___ altogether		Children may not have efficient strategies for adding 3 numbers Children will need secure knowledge of counting in 2s, 5s and 10s Children should be able to describe pictures using sentences and also create pictures from given sentences. As children have already learnt to add three 1-digit numbers, they should be able to add up to three groups of any 1-digit number. If there are more than three groups, children can use their understanding of counting in 2s, 3s, 5s and 10s to find the total
Introduce the multiplication symbol (2MD 1)	**To use the x symbol to represent multiply**	Is repeated addition always the most efficient method? Why? What does the multiplication symbol look like? How else can you write this repeated addition number sentence? What is the same about repeated addition and multiplication? What is different? Which addition number sentence matches the multiplication? Can you think of a story to match the multiplication?	There are 3 equal groups with ___ in each group. ___ + ___ + ____ = ___ ___ X ___ = ___		Children may not make the link between repeated addition and multiplication. Children may not know what each number in the multiplication number sentence represents. Children may find it challenging to put a context to a multiplication number sentence Children may find that using the language "lots of" builds on previous learning, but they should also use other variations interchangeably, such as "times", "multiplied by" and so on.
Multiplication sentences (2MD 1)	**To compose sentences about pictures showing multiplication**	What can you see in the picture? How many equal groups can you see? How many are in each group? What does the symbol mean? What do the numbers represent? How many ways can you describe the picture? If the answer is___, what could the multiplication be? Can you draw a picture to show this multiplication?	___ lots of ___ = ___ ___ multiplied by ___ is equal to ___ ___ X ___ = ___	Catrina's Cards (maths.org) Deepen understanding of multiplication as a process.	Children may mix up describing "5 lots of 3" and "3 lots of 5", as the totals are the same Children may find it more challenging to draw a picture to represent a multiplication than to identify the multiplication from a picture
Use arrays (2MD 1)	**To describe and draw arrays**	How can you organise the counters to help you find the total? How many rows are there? How many columns are there? What multiplication can you see in the array?	There are ___ rows and ___ columns. In this array, I can see ___ × ___ and ___ × ___		This step focuses on the fact that multiplication is commutative and children should be encouraged to identify the two multiplication sentences that can be seen in an array.

Extension and Greater Depth Opportunities

Spot the mistake.



Alex says, "There are 10 equal groups with 2 in each group. There are ten 2s."

True or False?

$5 + 5 = 2 + 2 + 2 + 2 + 2$

Draw an image or use cubes to help you explain your answer.

The total is 12, what could the addition and multiplication be?

With 12 cubes, how many different arrays can you create?

Once you have created your array complete:

___ × ___ = ___ × ___

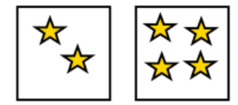
Tubes of tennis balls come in packs of 2 and 5

Whitney has 22 tubes of balls.

How many of each pack could she have?

How many ways can you do it?

How can you make the groups equal?



Think of a multiplication to complete:

$6 + 6 + 6 > \_\_ \times \_\_$

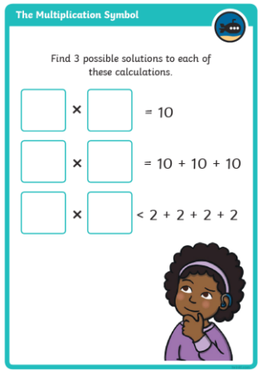
Write a story for the calculation 4×10

Draw an image to illustrate your story.

Part of this array is hidden.

The total is less than 16

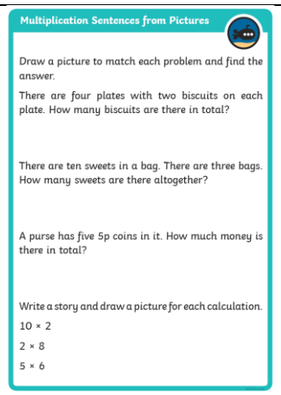
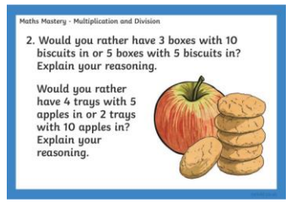
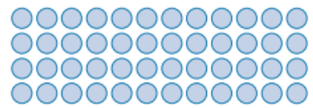
What could the array be?



Old Town Infant School and Nursery

Coastal Learning PARTNERSHIP

MATHS MEDIUM TERM PLANNING

		What two multiplication sentences can you see? Is it easier to count in ___s or ___s to find the total? Why do 3 × 2 and 2 × 3 have the same total?	There are ___ ×___ = __ altogether.		While the multiplication symbol is used more frequently, links should still be made to repeated addition and the language previously used to describe multiplication Children may not recognise that, for example, 3 × 4 = 4 × 3 Children may not see the different sets of equal groups in an array.	
Make equal groups – grouping (2MD 2)	**To make equal groups of a given size** **To divide a number by grouping into equal groups**	How many do you have altogether? How many are you going to put into each group? How many groups do you have? What does the symbol mean? What does each number represent? How can you use a number line to show equal groups? How are multiplication and division linked?	There are ___ altogether. I have put them into equal groups of ___ There are ___ groups ___ ÷ ___ = ___		Children are introduced to the division symbol for the first time, and this should be supported by language and sentence stems rather than just written in an abstract calculation Children may mix up grouping and sharing. If circling groups, children may not do this in an efficient way and may end up with objects left over at both ends of the image. Children may think that as multiplication is commutative, division must be too.	Which has the most biscuits: 4 packets of biscuits with 5 in each packet, or 3 packets of biscuits with 10 in each packet? Explain your reasoning.
Make equal groups – sharing (2MD 2)	**To share objects/number into equal groups**	How many do you have altogether? How many groups are you going to share them between? How many does each group have? What does this symbol (÷) represent? What does each number represent? Can you draw a picture to represent this calculation? How is sharing different from grouping? How is it similar?	There are ___ altogether. There are ___ equal groups. There are ___ in each equal group. ___ shared equally between ___ groups is equal to ___ ÷ ___ = ___		When dividing larger numbers, children could use base 10 and this may be a useful opportunity to recap place value and exchanging. Children could also compare sharing and grouping and think about what the numbers represent in each structure Children may not count the number in each group to find the answer. When using base 10, children may not exchange, so they may think that they cannot complete calculations or will complete them inaccurately.	 Write these addition sentences as multiplication sentences. 10 + 10 + 10 + 5 + 5 = 2 + 2 + 2 + 4 = 2 + 2 + 4 + 4 = 5 + 5 + 5 + 2 + 3=
The 2 times table* (2MD 1)	**To solve problems using the 2 times table**	How can you show counting in 2s? How do you know what lots of 2 are? Would drawing a picture help you to work out the multiplication? What do you need to do with the two numbers in the number sentence? Do you always need to start counting from 2? If you know what 5 × 2 is, how can you work out 6 × 2? If you know what 10 × 2 is, how can you work out 9 × 2? Can you show the multiplication another way?	___ × 2 is the same as ___ lots of 2 ___ multiplied by 2 is equal to ___ I know that ___ × 2 = ___ , so I can add/subtract 2 to work out ___× 2	Nrich – Clapping Times	Children may always start from the first number in the times-table, instead of starting from a known fact.	Find different ways to find the answer to 12 × 4.  *Children are expected to use their 2, 5 and 10 times tables to answer this question.* Dora has 10 biscuits.  She wants to share them equally at her party. How many people could be at the party? I am thinking of a number between 20 and 30 I can only make equal groups of 5 What must my number be? What happens when I try to make groups of 2 with it? What happens when I try to make groups of 10 with it? Alex has 20 sweets and shares them between 5 friends. Tommy has 20 sweets and shares them between 10 friends. Whose friends will receive the most sweets? How do you know? You have 30 counters. How many different ways can you put them into equal groups? Write down all the possible ways.
Divide by 2* (2MD 2)	**To apply knowledge of 2 times table to solve division calculations**	How can the 2 times-table help you? How are division and multiplication linked? Will you be grouping or sharing for this question? How do you know? How can making/drawing an array help you? How many groups of 2 can you make? How can you share this between 2 equal groups? How can you use a number line to complete the division? If you know what 20 divided by 2 is, what is 10 divided by 2?	There are ___ altogether. There are ___ in each group. There are ___ groups. ___ divided by 2 is equal to ___		While it is important that children use concrete resources, they should also be aware that they can use the 2 times-table to help them fluently divide by 2, in the abstract. Children should be encouraged to spot patterns to help them complete calculations efficiently Children may be over-reliant on practical resources and not use their times-table knowledge.	
Doubling and halving (2MD 2)	**To apply knowledge of the 2 times table to**	What does “double” mean? What does “halve” mean? How do you double a number? How do you halve a number? How can you use counters to help you double a number? Can you write this as a number sentence?	Double ___ is ___ Half of ___ is ___ Double ___ is ___ , so double ___ is ___ Half of ___ is ___ , so half of ___ is ___	Nrich - Double or Halve? Nrich – Ring a Ring of Numbers	Guide the children towards the connection that when they double a number, they multiply by 2 and when they halve a number, they divide by 2 Children may not make the connection between doubling and halving and the 2 times-table.	

Old Town Infant School and Nursery

Coastal Learning PARTNERSHIP

MATHS MEDIUM TERM PLANNING

	double and halve numbers/objects	How is doubling linked to the 2 times-table? How is halving linked to the 2 times-table?		Nrich – More numbers in a ring	Children may be over-reliant on manipulatives or pictures to double or halve, rather than multiplying or dividing by 2	
Odd and even numbers	To recognise and identify odd and even numbers	What do you notice about odd/even numbers? How do you know if a number is odd/even? Why is the 2 times-table important for odd and even numbers? If your number is even/odd, will the next number you count be odd or even? Why? What digit is in the ones column? Why is this important? Can you halve even/odd numbers? How do you know?	Even numbers have ___ in the ones column. Odd numbers have ___ in the ones column. Even numbers can be divided by ___ to give a whole number answer. The next whole number after an ___ number is an ___ number.	Nrich – Even and odd Nrich – How odd? Even and Odd (maths.org) Whole class about odd and even numbers.	Zero and other numbers with zero in the ones column may confuse children. Children may not recognise that if a number is even, the next number must be odd. It may be useful to think of a definition for odd and even numbers and to identify non-examples as well as examples of both. Children should recognise that an even number can be halved to give a whole number answer, as it is divisible by 2	
The 10 times-table* (2MD 1)	**To solve problems using the 10 times table**	How can you show counting in 10s? How do you know what lots of 10 are? Would drawing a picture help you to work out the calculation? How can you use base 10 to help you find the answer? Do you always need to start counting from 10? If you know what 10 × 5 is, how could you work out 10 × 6? What other way could you show this calculation?	___ × 10 is the same as lots of 10 ___ × 10 = ___ , so ___ × 10 = ___ When counting forwards in 10s, the number after ___ is ___ When counting backwards in 10s, the number after ___ is ___	Nrich – Clapping Times	Children may always start from the first number in the times-table, instead of starting from a known fact.	
Divide by 10* (2MD 2)	**To apply knowledge of 10 times table to solve division calculations**	How can the 10 times-table help you? How are division and multiplication linked? Will you be grouping or sharing for this question? How do you know? How can you use base 10 to help you? How many groups of 10 can you make? How can you share this between 10 equal groups? How can you use a number line to complete the division?	There are ___ altogether. There are in ___ each group. There are ___groups. ___÷ 10 = ___		Children experience a range of grouping and sharing activities, building on their previous learning, and should be reminded of the differences and similarities between these two structures. They should be confident counting backwards in 10s and understand that they can use this to solve division calculations. Children may be over-reliant on practical resources and not make connections to their times-table knowledge.	
The 5 times-table* (2MD 1)	**To solve problems using the 5 times table**	How can you show counting in 5s? How do you know what lots of 5 are? Would drawing a picture help you to work out the multiplication? Do you always need to start counting from 5? If you know what 10 × 5 is, how could you work out 11 × 5? What do you notice about the ones column of the numbers in the 5 times-table? How are the 5 times-table and 10 times-table similar? How are they different?	___ × 5 is the same as ___lots of 5 ___ × 5 = ___ , so ___ × 5 = ___ When counting in 5s, the number after/before ___ is ___	Nrich – Clapping Times	Children may think that the 5 times-table stops at 50 Children may always start from the first number in the times-table, instead of starting from a known fact. As with the other times-tables covered earlier in the block, zero should be included, so that children realise that 0 × 5 = 0.	
Divide by 5* (2MD 2)	**To apply knowledge of 5 times table to solve division calculations**	How can the 5 times-table help you? How are division and multiplication linked? Will you be grouping or sharing for this question? How do you know? How could making/drawing an array help you? How many groups of 5 can you make? How can you share this into 5 equal groups? How can you use a number line to complete the division?	There are ___ altogether. There are in ___ each group. There are ___groups. ___÷ 5 = ___		Children may be over-reliant on practical resources and not make connections to their times-table knowledge. Children answer questions involving grouping and sharing and need to have efficient strategies for calculating both types of problems. At this point, children could explore the effect of dividing the same number by 2, 5 and 10 and comparing the answers. They may start to see links between the 5 and 10 times-tables	

Amir has some counters.
He makes 5 equal groups.

The amount he started with is greater than 10 but less than 35

How many counters could he have started with?

How many will be in each group?

Ron has shared some grapes equally between two friends.

Ron's friends

Each friend receives fewer than 50 grapes.

Complete the sentences to describe the number of grapes Ron started with.

He must have started with...

He could have started with...

He can't have started with...

Tommy says that when he adds two odd numbers together, his total will be even.

Is he correct?
Convince me.

What else can you find out?

Whitney says,

I have added two one-digit numbers. My answer divides into 2 equal groups.

What could Whitney's numbers be?

Is this the only possible answer?

Which numbers would not be possible?

Explain your answers.

Use the number cards to make multiplication and division sentences.

How many can you make?

Mrs Owen has some sweets.

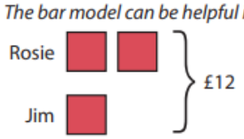
She shares them equally between 10 tables.

How many sweets could each table have?

Find as many ways as you can.

What do you notice about your answers?

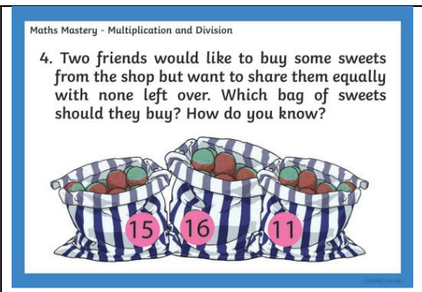
Together Rosie and Jim have £12.
Rosie has twice as much as Jim.
How much does Jim have?
The bar model can be helpful in solving these types of problems.



Old Town Infant School and Nursery

Coastal Learning PARTNERSHIP

MATHS MEDIUM TERM PLANNING

The 5 and 10 times-tables*	**To recognise and describe the link between the 5 and 10 times tables**	Which numbers are in the 5 times-table? Which numbers are in the 10 times-table? Which numbers are in both? What do you notice? What patterns can you spot? How many lots of 5 make 10? Are all the numbers in the 10 times-table also in the 5 times-table? Why? Are all the numbers in the 5 times-table also in the 10 times-table? Why?	All numbers in the ___ times-table are also in the ___ times-table. Some numbers in the ___times-table are also in the ___ times-table. ___ × 10 = ___ × 5	**Always, sometimes, never** Tables Teaser (maths.org) Interactive Activity to consolidate 2, 5, 10 tables.	Children may not be aware that the equals sign can be used to show equivalence Children may believe that all the numbers in the 5 times-table are also in the 10 times-table. Children may find it difficult to make the calculations equal if they do not make the link that 2 lots of 5 = 10 Guide them to identify that all numbers in the 10 times-table are also in the 5 times-table, but only some of the numbers in the 5 times-table are also in the 10 times-table.	 Two friends want to buy some marbles and then share them out equally between them. They could buy a bag of 13 marbles, a bag of 14 marbles or a bag of 19 marbles. What size bag should they buy so that they can share them equally? What other numbers of marbles could be shared equally? Explain your reasoning.
Post-assessment:	WRH end of block multiplication and division assessment – snip as feel appropriate Previous multiplication and division SATs questions – snip as feel appropriate					