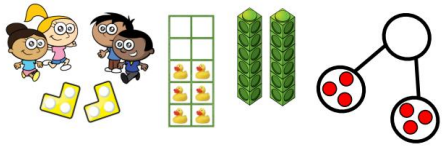
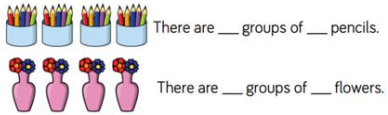
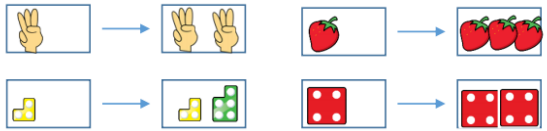
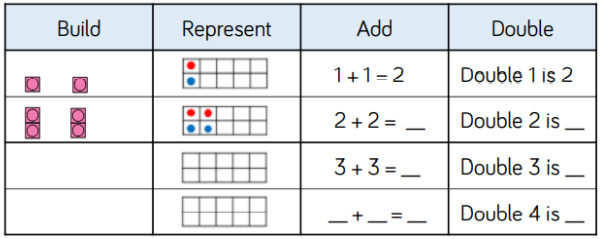
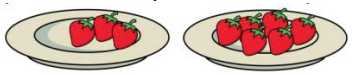
Mathematics – **Number:** Multiplication and Division

Area	Objectives	Suggested Activities	Vocab
Early Multiplication and Division Skills			
Cross-curricular links **PE** – *in dance use movements that include doing things in groups of 2 by 2 and so on. Children share equipment with peers using 1:1 distribution.* **Art –** *sharing equipment using 1:1 distribution. Print patterns using same size groups e.g. pairs, triangles and so on.* **DT** – *when exploring products before design look at groups of features e.g. how many wheels does a truck have, a car etc? Add the groups of 4 together.* **Science –** *When exploring the body look at pairs of parts.* **PSHE –** *see science.* **ICT –** *computer activities involving multiplication and division. Double clicking on a mouse. When programming instruction in Beebots and other software encourage children to double or halve moves.* **Music –** *use songs such as Noah's Ark.* **Cooking** *– sharing equipment 1:1. Putting ingredients into equal groups. Counting how many ingredients there are e.g. in two boxes of eggs. Doubling and halving ingredients being added.*			
0 – 3 years (8–20 months)	To join in familiar number songs and rhymes such as Noah's Ark – 'the animals went in 2 by 2'.	• Sing counting songs, supported by props or visual cues, such as a presentation on the IWB. Children place objects or move items on the IWB each time they hear a number in the count. • Use Education City with older children to join in times tables songs. • Use tables disco CD with props as visual support.	One Two Pairs Triangles Square Group Same Repeat Share Equal Pattern (spotty/stripy – look at 'same as') Half double
0 – 3 years (16–26 months)	To explore objects by manipulating them into piles, stacks or groups.	• Children make groups of motivating objects. • Children make towers of different coloured Lego, cubes or wooden blocks. • Do nature walk where children collect groups of sticks, leaves or stones. Give a set number to collect e.g. groups of 2 or 3. Link to Art topics or science. • In PE, put balls or bean bags into piles for each team. • In cooking, group ingredients. • Explore objects that come in pairs such as gloves or socks or knives and forks.	
0 – 3 years (22-36 months)	To make the same size group patterns e.g. pairs, triangles, squares.	• Use the Numicon pegs and challenge the children to make same size group patterns. • Make collage/textile pictures for art by arranging groups into patterns of the same size.	

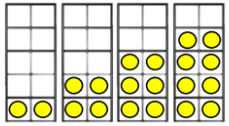
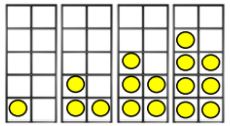
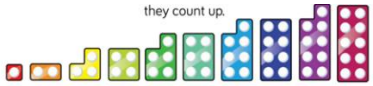
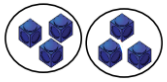
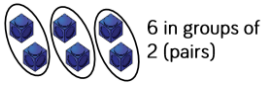
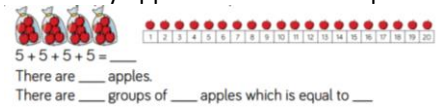
		• Make patterns with toys or everyday objects such as families with Playmobil.	
3- 4 years **(30-50 months)**	To make equal groups and count how many in each group. To count repeated groups of the same size.	• Share out food, resources or equipment giving equal groups to peers. • Make children class monitors for giving out resources. • Arrange peers into teams of the same number for games. • Share out counters for games. • Share out visual timetable cards so everyone has an equal number. • Match objects to template (giant die – matching cubes or raisins to the dots to make equal groups). • Putting objects in containers such as bags – put 3 apples in each bag. Sorting out equal share for picnic outside or on a trip. • Make same size families with play people. • Make pop groups of the same size using photos from magazines. • Make groups of superheroes or cartoon characters for different movies – use photos from magazines. • Use hands to make groups of fingers the same size on each. • Same size groups of transport. • Go shopping – children collect items in groups of the same size e.g. 3 apples, 3 orange. • Look at repeated groups on the IWB. Children count. • For activities in class or for PE put the children into groups – how many in each group? How many altogether. • Look at images of repeated groups that the children can count – link to topics e.g. how many groups of cars or certain animals in the rainforest. How many in each group? How many altogether? • 6. When giving out resources encourage children to count how many groups, how many resources in each group and how many altogether.	
Reception **(40-60 months)**	To share objects using 1:1 distribution.	• Use cubes, Lego or wooden blocks to make different stacks of a repeated number (children distribute 1:1) e.g. 'Put two stacks of three on your table', 'I want three stacks of two', 'One stack of five' or 'Five stacks of one'. 'How many are there?' Repeat with different directions e.g. rows of or groups of. • Encourage children to make groups of motivating objects e.g. five groups of three. Get them to push the objects together and count. Give out different numbers of cups and get the children to redistribute the objects 1:1 into the cups. Count how many in each cup. Repeat.	

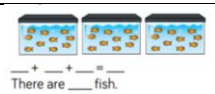
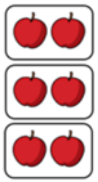
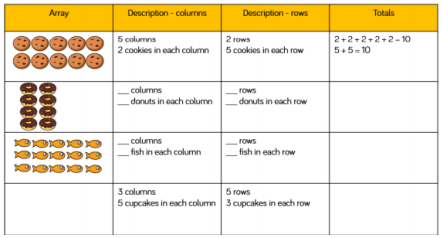
	To experience doubling and halving.	• Cut out pictures of interest (helicopters or fairies) children distribute 1:1 into equal groups. • When role-playing shops – children distribute equal coins to each peer. • Encourage children to share out ingredients in cooking. • Encourage children to share out equipment e.g. number of balls or hoops or shapes or pipe cleaners. • Use story problems e.g. John has three plates of biscuits. There are four biscuits on each plate. Or Ricky has six chairs. He put them at three tables. He put the same number of chairs at each table. • Use mirrors to show what doubling objects looks likes. • Encourage the children to say the doubles as they build them e.g. double 2 is 4 etc. • Use Numicon Shapes to visually look at doubling and halving. • Use cubes to create doubles and halves. • Use sweets/toys to give double or halves to children or toys. • Use computer programmes for doubles and halves such as Mathbase 2 and Education City. • In play situations model doubling e.g. 1 car goes into the garage, now double go in (show 2). • Double and halve ingredients being added during cooking. • Make pictures by doubling and halving shapes and sticking them. • Allocating points in PE e.g. if you hit the outside of the bucket you get 1 point, if it goes in you get double. • Doubling and halving scores in games.  • Provide sets of dominoes and ask the children to find the doubles. • Play doubles. The children take turns to toll 2 dice and score a point each time they roll a double. The first to reach 3 wins. • Ask the children to sit opposite each other. One child sets out a quantity of small items such as cubes or bears. They partner doubles it by matching their quantity. • Play snap pr matching pairs games using pictorial playing cards or dot cards. Encourage the children to say the doubles as they make them. The person with the most doubles or pairs at the end wins the game. • Have numbers or numicon shapes hidden around the classroom/outdoor area. Give each child a numicon shape and ask them to find one the same to make a double. Encourage them to say the double they have found e.g. double 3 is 6.	

		• Provide a ladybird of butterfly shape, some pompoms and tweezers. Ask the children to use the tweezers to make doubles by adding the same number of pompoms to each side. How many different doubles can they make? Can the make one that is not a double and tell you why?	
Area	**Objectives**	**Suggested Activities**	**Vocab**
Cross-curricular links **PE –** making teams of odd and even numbers. Play games involving sharing objects into hoops (look at how many objects in each hoop). Use games such as Boccia – Children get different multiples of points depending on how close their balls are and if they hit the ball they can double their points. **Art –** make art pieces where materials are split into quadrants on the page. **DT –** children work out how much material they need e.g. they know how much gift ribbon for one box, how many for2? Or they know how much for 5 boxes, how many for 1? **Science –** work out amounts of items needed for experiments e.g. we are going to give each plant 50ml of water, how much water do I need for 2 plants? **PSHE –** use multiplication and division when exploring jobs. **ICT –** computer activities involving multiplication and division. When programming instruction in Beebots and other software encourage children to double or halve moves. **Cooking –** splitting ingredients into different bowls to make different lots. Finding out how much they need if a recipe is for 2 people and there are 6 or 8 of them**.**			
Further Multiplication and Division Skills **Bridging 1**	To be able to make equal groups	• Children begin by using stories which link pictures and concrete manipulatives to explore making equal groups and write statements such as 'there are ____ groups of ____'. They will recognise and explain how they know when they are equal or not. Children see equal groups that are arranged differently so they understand that the groups look different but can still be equal in number. At this stage, children do not explore multiplication formally. **Children should have lots of practical experience.** • Are the groups equal or unequal? Write a label for each  • Complete the sentences  • Josh is drawing equal groups of 3. Complete his drawing: 	any odd even multiples facts grouping sharing divide multiply tables problem repeat division multiplication subtraction addition array order inverse numerals to 100 and beyond
	To be able to make doubles	• Children continue to explore doubling with numbers up to 20. Reinforce understanding that 'double' is two groups of a number of an amount. Children show and explain what	

	To be able to halve and share	doubling means using concrete and pictorial representations. **They should work practically first.** They record doubling using the sentence, 'Double ____ is ____' and use repeated addition to represent doubles in the abstract. They look at representations to decide whether that shows doubling or not. • Use objects or pictures. Ask the children to make a double of each e.g. 1 car. Child another car to make it a double. • Circle the representation which have been doubled. Can the children add or take away a picture of an object to make them doubles?  • Take a numicon piece and double it. Complete the sentences:  Double ___ is ___  Double ___ is ___ • Complete and continue the table:  • They children will halve quantities by sharing items into 2 equal groups. The distinction between fair and unfair sharing can be used to emphasise the idea of half as being one of 2 equal parts. Once children can confidently halve small quantities, they can explore sharing between 3 or 4 people. They will notice that sometimes there are items left over and may come up with suggestions for how to resolve this. • Show children a bowl of strawberries. Explain that you are going to share them between 2 equal groups so there will be half for you and half for your friend. Put a handful straight onto each plate without counting – make sure that one plate has more strawberries than the other. Ask the children if that is fair. Prompt them to show you how to share the strawberries fairly.  • Other opportunities include relay races with unequal teams, games with unequal teams etc.	

Build	Represent	Add	Double
		1 + 1 = 2	Double 1 is 2
		2 + 2 = __	Double 2 is __
		3 + 3 = __	Double 3 is __
		__ + __ = __	Double 4 is __

	To know odd and even numbers	• Children should also have opportunities to share with 3 or 4 people e.g. fruit at snack time, sharing out cards for a game. Prompt the children to talk about why sometimes there might be equal groups and sometimes some things may be left over. • Have some pictures ready to show the children. Some will show equal groups and some will show unequal groups. Ask the children to discuss and sort the pictures. • Have a teddy bears picnic: provide 2 bears, 2 plates and an equal amount of plastic food items. Ask the children to share out the food so they have equal amounts. Add another bear and then another. Do they get more or less food? • The children begin to understand that quantities which can be shared into 2 equal groups with not items left over are even. Those which have one left over when they are shared into 2 equal groups are odd. Encourage the children to notice this structure on numicon and by building pair wise patterns on 10 frames.    • Children can also group objects into pairs. If there is nothing left over, the group was even and if there is one left over, the group was odd.  	
Bridging 2	To be able to add equal groups	• Children use equal groups to find a total. They focus on counting equal groups of 2, 5 and 10 and explore this within 50. Children should begin by linking this to real life, for example, animal legs, wheels, flowers in vases etc. Stem sentences alongside number sentences can help the children link the calculation with the situation. Ensure the children have the opportunity to say their sentence aloud. • How many wheels altoghether? How many fingers altogether?   • How many apples are there? Complete the sentences:  • How many fish are there? Complete the sentences:	

	To be able to make arrays	 Can you show this using ten frames? • Children begin to make arrays by making equal groups and building them up in columns and rows. They use a range of concrete and pictorial representations alongside sentence stems to support their understanding. Children also explore arrays built incorrectly and recognise the importance of columns and rows. • Build an arrays with counters to represent the apples. Complete the sentences: There are ___ apples in each row. There are ___ rows. ___ + ___ + ___ = ___ There are ___ apples altogether.  • Complete the tables: 	
Bridging 3	To recognise odd and even number	• Model what odd and even numbers are using equipment that highlights the differences e.g. using socks (pairs and an odd one, Numicon Shapes, towers of cubes). Look at how even numbers can be shared equally between two and odd can't. • Look at numbers around the school discussing if it is odd or even. • Go on a local walk and look at house numbers – in class children label houses with odd and even number. Look at the sequence. • In group games, make one group the odd number group and one the even number group assigning them labelled bibs e.g. in football or catch. Odd numbers can only pass to odd numbers and so on. • Give children an odd or even number and ask them to get into two groups and then sequence their numbers. • At the end of games where items are collected such as points, tokens, balls or bean bags ask the children which person has odd or even numbers. • Play computer games including odd and even numbers such as MathBase. • Include counting songs and raps. Look at Education City and lgfl site. • Add odd or even numbers of ingredients in cooking.	

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<td>To be able to make equal groups – grouping</td>
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Children start with a given total and make groups of an equal amount. They record their understanding in sentences, not through formal division at this stage. Children can develop their understanding of equal groups by also being exposed to numbers which do not group equally.
How many equal groups of 2 can you make with these mittens?
 
There are ___ groups of 2 mittens.
If you had 10 mittens, how many equal groups of 2 mittens could you make?
Take 20 cubes. Complete the sentences:
I can make _____ equal groups of 2
I can make _____ equal groups of 5
I can make _____ equal groups of 10
Complete the table. Use equipment to help you:

<table>
<tr><th>Representation</th><th>Description</th></tr>
<tr><td>  </td><td>There are ___ altogether.
There are ___ equal groups of ___</td></tr>
<tr><td>  </td><td>There are ___ altogether.
There are ___ equal groups of ___</td></tr>
<tr><td>  </td><td>15 has been sorted into 3 equal groups of 5</td></tr>
<tr><td>  </td><td>___ has been sorted into ___ equal groups of ___</td></tr>
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Children explore sharing as a model of division. They use 1:1 correspondence to share concrete objects into equal groups. Children also need to be given the opportunity to.see when a number of objects cannot be shared equally into equal groups.
Share the muffins equally between the two plates. Complete the sentence:
____ cakes shared equally between 2 is _____
 
Collect 20 cubes. Use hoops to represent your friends.
Can you share the cubes between 5 friends? 20 shared between 5 equals _____
Can you share the cubes between 2 friends? 20 shared between 2 equals _____
Can you share the cubes between 10 friends? 20 shared between 10 equals _____
Tim has 16 bananas. He shares the equally between two boxes. How many bananas are in each box? Represent and solve the problem.

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<tr>
<td>Milestone 1</td>
<td>To be able to count in 10s</td>
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Children count in groups of tens for the first time (building on from counting in 2s and 5s). They should use pictures, bead strings and number lines to support their counting.

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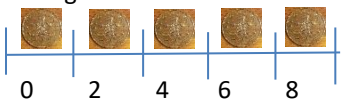
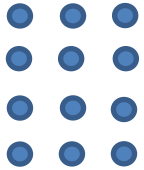
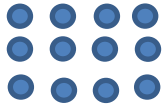
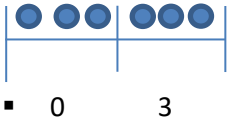
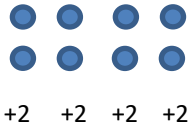
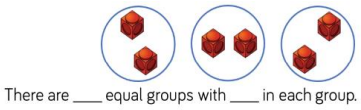
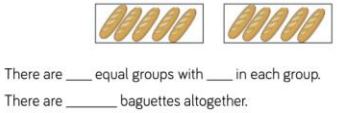
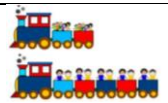
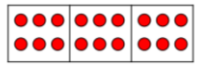
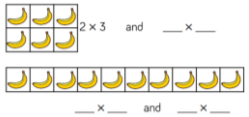
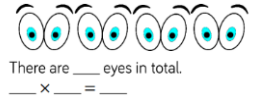
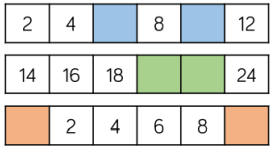
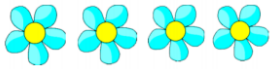
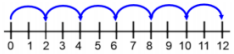
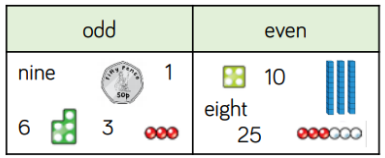
	To solve one-step problems by using objects and/or pictorial representations (understanding division as sharing or grouping). To link multiplication to repeated addition and division to repeated subtraction. To begin to use arrays to solve problems.	Counting in tens on a number line will also support the children to see the similarities between the numbers when we count in tens. • How many birds are there altogether?  There are ____ birds in each tree. There are ____ trees. There are ____ birds altogether. • How many flowers are there altogether?  There are ____ flowers in each bunch. There are ____ bunches. There are ____ flowers altogether. • Use numicon and base 10 to count in tens. Can we count forward and backward in tens? • Continue to develop skills from Early Multiplication and Division by using motivating objects or pictures to make multiple groups or share. Refer to suggested activities and adapt. • Use story problems with one-step linked to multiplication or division e.g. John has 3 pens with 3 sheep in each. How many sheep does he have? Or John has sixteen sweets to share between four friends. How many sweets does each friend get? • Use age appropriate and motivating objects as well as sign cards to show the link to repeated addition/subtraction. • Use number lines and visual representation to show repeated addition/subtraction e.g. using coins and a number line.  • 0 2 4 6 8 10 2x5 • (See Progression of Calculation Document) • Children draw pictorial representations to help e.g. 3 x 3 •  • Or -3 -3 • 6÷3 =  6 1 2 • Use circle cards (large) to show arrays e.g. 2 rows of 3  • Rearrange to show it's the same as 3 rows of 2: 	

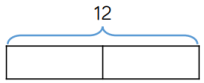
		 • Link to division and sharing e.g. 12 shared between 3:  ○ Show that it is the same as 12 shared between 4:  • Children use arrays on number lines. • rows of 3:  • Children draw arrays and link to number sentences as their confidence develops. • Highlight link to repeated addition and subtraction e.g. • x 4 =  +2 +2 +2 +2	
Milestone 2	To recognise equal groups	• Children should describe equal groups using stem sentences to support them. It is important that children know which groups are equal and unequal. **The addition and multiplication symbols are not used yet.** Instead children should use the language of addition and multiplication to support them in understanding repeated addition and multiplication. • Complete the stem sentences:  There are ___ equal groups with ___ in each group.  There are ___ equal groups with ___ in each group. There are _____ baguettes altogether. • Describe the equal groups:	

	To be able to make equal groups	 What is the same and what is different in each group? • Children should be able to make equal groups to demonstrate their understanding of the word 'equal'. Children should be exposed to numerals and words, as well as multiple representations. Children should use equipment such as Base 10, numicon, cubes and counters.	
	To be able to add equal groups	• Children should be able to connect equal groups to repeated addition. • Complete:  There are ___ equal groups with ___ in each group. There are ___ 3s. ___ + ___ = 6 • Complete:  There are ___ equal groups with ___ in each group. There are three ___s. ___ + ___ + ___ = 12	
	To know and use the multiplication symbols (x)	• Children are introduced to the multiplication symbols for the first time. They should link repeated addition and multiplication together, using stem sentences to support their understanding. They should be able to interpret mathematical stories and create their own involving multiplication. The use of concrete resources and pictorial representations is still vital for understanding. • Complete the sentences to describe the equal groups:  ___ + ___ + ___ = 18 ___ × ___ = 18 There are ___ equal groups with ___ in each group. There are three ___.  ___ × ___ = ___ ___ lots of 3 = ___ ___ multiplied by ___ = 12 • Complete:  4 lots of 3 ○ = 1 × ___ • Treasure hunt – hide signs in sand/pasta and children find and name them. • Put up big signs in the hall/playground. Call out the name of a sign. Children run to the correct sign. Vary the language for each sign depending on ability e.g. multiply, times, divide or share. • Using blank die write on the words for multiplication and division. Children roll word die as well as a number die. They create and record number sentences using signs. • 'Show me' – give a word for multiply/divide depending on ability and understanding. Children record the sign on their whiteboards.	

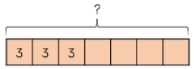
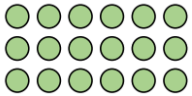
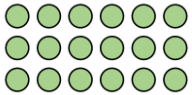
	To be able to use arrays to demonstrate commutativity	• Children explore arrays to see the commutativity of multiplication facts e.g. 5 x 2 = 2 x 5. They use of the array could be used to help children calculate multiplication statements. The multiplication symbols and language of 'lots of' should be used interchangeably. • On the image, find 2 x 5 and 5 x 2  • Complete the number sentences to describe the arrays:  • Draw an array to show: 4 x 5 = 5 x 4 3 lots of 10 = 10 lots of 3 • Also see activities in the calculation progression document.	
	To recall and use multiplication facts for the 2, 5 and 10 multiplication tables.	• Use songs (Times Tables Disco). • Use songs and activities on Education City. • Play quick fire games (see activities for Further Addition and Subtraction Skills Objective 6). • Use story problems linked to these tables for children to solve mentally. (Use age appropriate events/characters). • Use maths activities such as MathBase 1, 2 and 6. • Children should be comfortable with the concept of multiplication so they can apply this to multiplication tables. Images, as well as number tracks, should be used to encourage the children count in twos. Resources such as cubes and number pieces are important for children to explore equal groups within the 2 times-table. • Count in 2s to calculate how many eyes there are:  • Complete the number track:  • How many wheels are there on five bicycles? If there are 14 wheels, how many bicycles are there?	

	To be able to make equal groups (sharing)	 • Children can already count in 5s from any given number. They will also have developed understanding of the 2 times table. This small step is focused on the 5 times table and it is important to include the use of zero. Children should see the = sign at both ends of the calculation to understand that it means 'equals to'. • How many petals altogether? Write the calculation   • There are 35 fingers. How many hands? _____ x 5 = 35 • Use <, > or = to make the statements correct: 2 × 5 ◯ 5 × 2 3 × 2 ◯ 4 × 5 10 × 5 ◯ 5 × 5 • Children have counted in 10s from any given whole number. This small step is focused on the 10 times-table and it is important to include the use of zero. Children should see the = sign at both ends of the calculation to understand what it means. • How many crayons are there altogether? There are ____crayons altogether. ___ x 10 = __  • Altogether there are 30 bottles, how many walls are there? ____ x 10 = 30  • Think of a multiplication fact for 10s to go in each box:  • Children divide by sharing objects into equal groups using 1:1 correspondence. They need to do this using concrete manipulatives in different contexts, then move onto pictorial representations. Children will be introduced to the ÷ symbol. They will begin to see the link between division and multiplication. • Share the 12 cubes equally into the two boxes. There are ____cubes altogether. There are ___ boxes. There are ____cubes in each box.  Can you share the 12 cubes equally into 3 boxes?	

	To be able to make equal groups (grouping)	• 24 children are put into 4 equal teams. How many children are in each team? Can you use manipulatives to represent the children to show how you found your answer? • Children divide by making equal groups. They then count on to find the total number of groups. They need to do this suing concrete manipulatives and pictorially in a variety of contexts/ They need to recognise the link between division, multiplication and repeated addition. • Pencils come in packs of 20. We need to put 5 in each pot. Hoe many pots will we need? There are ____ pencils altogether. There are ___ pencils in each pot. There are ___ pots.  • Mrs Green has 18 sweets. She puts 3 sweets in each bag. How many bags can she fill?  • Mo uses a number line to work out how many equal groups of 2 he can make from 12. Use a number line to work out how many equal groups of 5 you can make from 30. 	
	To know odd and even numbers.	• Building on from year 1, children should be able to recognise odd and even numbers. They will use concrete manipulatives to explore odd and even numbers and the structure of these. • Use counters to make each number and share them into two equal groups. How does this help you decide whether a number is odd or even? Show this in a table. Can you see any patterns?   • Which numicon pieces are odd? Explain why? Find or draw other odd and even pieces. What do you notice? • Spot the mistakes:  Can you make your own odd and even sets? • Children should be secure with grouping and sharing. They will use this knowledge to help them divide by 2. Children should be able to count in 2s, 5s and 10s and know their 2, 5 and 10 times table.	

	To recall and use division facts for the 2, 5 and 10 multiplication tables.	• Complete the stem sentences:
		I have ___cubes altogether. There are ___in each group. There are___ groups.
		 
		• Group the socks into pairs. Complete the number sentences.
		 
		• Mo and Tommy have 12 sweets between them. They share them equally, How many sweets does each child get? There are ____ sweets altogether. There are __ groups. There are __ in each group. Complete the bar model and write a calculation to match.
		 
		• During this step, children focus on efficient strategies and whether they should use grouping or sharing depending on the context of the question. They use their knowledge of the five times table to help them divide by 5. They will continue to use the = sign.
		• Take 30 cubes. How many towers of 5 can you make? You can make __ towers of 5. ___ towers of 5 is the same as 30. 30 is the same as __ towers of 5.
		• 40 pencils are shared between 5 children. How many pencils did each child get?
		 
		• Group the 1p coins into 5s. How many 5p coins do we need to make the same amount of money? 
		• Draw coins and complete the missing information.
		  • ___ lots of 5p = 20 one pence coins
		  • ___ lots of 5p = 20p
		  • 20p = ___ × 5p
		  • 20p ÷ 5 = ___
		• Children should be already able to multiply by 10 and recognise multiples of 10. They will need to use both grouping and sharing to divide by 10 depending on the context of the problem. Children start to see that grouping and counting in 10s is more efficient than sharing into 10 equal groups.
		• Apples can be sold in packs of 10. How many packs can be made below?
		  . When 30 apples are sold in packs of 10, ___ packs of apples can be made.
		• I have 70p in my pocket made up of 10p coins. How many coins do I have? Draw a picture to prove you answer.	

		• Fill in the missing numbers:
		  • 70 ÷ 10 = __
		  • 6 tens ÷ 1 ten = __
		  • 5 = __ ÷ 10
		  • There are __ tens in 40	

Milestone 3	To understand that multiplication is making equal groups. To be able to recall the multiplication and division facts for the 3, 4 and 8 times table	• Children recap their understanding of recognising, making and adding equal groups. This will allow them to build on prior learning and prepare them for the next small steps. • Describe the equal groups:  • Complete:  • Children draw on the knowledge of counting in threes in order to start to multiply by 3. They use their knowledge of equal groups to use concrete and pictorial methods to solve questions and problems involving multiplying by 3. • There are five towers with 3 cubes in each tower. How many cubes are there altogether? __ + __ + __ + __ + __ = __ __ × __ = __  • There are 7 tricycles in a playground. How many wheels are there altogether? Compete the bar model to find the answer.  • There are 3 tables with 6 children on each table. How many children are there altogether? ___ lots of _____ = _____ _____ x _____ = _____ • Children explore dividing by 3 through sharing into three equal groups and grouping in threes. They use concrete and pictorial representations and use their knowledge of the inverse to check their answers. • Circle the counters in groups if 3 and complete the division  ___ ÷ 3 = ___ Circle the counters in 3 equal groups and complete the divison  ___ ÷ 3 = ___ What is different about the ways you have circled the counters?	

- There are 12 pieces of fruit. They are shared equally between 3 bowls. How many pieces of fruit are in each bowl? Use cubes/counters to represent fruit and share between 3 circles.

- Hairbands come in packs of 3. If there are 21 hairbands altogether, how many packs are there

- Children draw together their knowledge of multiplying and dividing by three in order to become more fluent in the three times table. Children apply their knowledge to different contexts.
- Complete the number sentences:

1 triangle has 3 sides. $1 \times 3 = 3$
3 triangles have ___ sides in total. $3 \times \_\_\_ = \_\_\_$
___ triangles have 6 sides in total. $\_\_\_ \times \_\_\_ = 6$
5 triangles have ___ sides in total. $\_\_\_ \times \_\_\_ = \_\_\_$

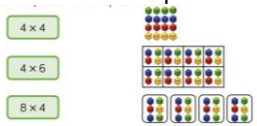
- Tick the number sentences that the image shows:

$12 \div 3 = 4$ $3 = 12 \div 4$
$12 = 4 \times 3$ $3 \times 12 = 4$
$3 \div 4 = 12$ $3 \times 4 = 12$

- Fill in the missing number facts:

$1 \times 3 = \_\_\_$ $\_\_\_ \times 3 = 30$
$2 \times \_\_\_ = 6$ $8 \times \_\_\_ = 24$
$\_\_\_ = 3 \times 3$ $6 \times 3 = \_\_\_$
$9 \times 3 = \_\_\_$ $21 = \_\_\_ \times 3$

- Building on their knowledge of the two times table, children multiply by 4. They link multiplying by 4 to doubling the doubling again. Children connect multiplying by 4 to repeated addition and counting in 4s. To show the multiplication of 4, children may use number pieces, cubes, counters, bar models etc
- Match the multiplication to the representation:



- How many dots are there altogether?

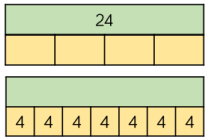
There are ___ dice with ___ dots on each.
There ___ fours.
___ × ___ = ___ dots.

- There are 4 pens in a pack. How many pens are there in 7 packs?

- Children explore dividing by 4 through sharing into four equal groups and grouping in fours. They use concrete and pictorial representations and their knowledge of the inverse to check their answers.
- Circle the buttons in groups of 4

 . Can you also split the buttons into 4 equal groups? How is this the same? How is it different?

- There are some cars in the car park. Each car has 4 wheels. In the car park there are 32 wheels altogether. How many care are there? _____ ÷ _____ = _____
- Complete the bar models and the calculations:



24 ÷ 4 = ___

___ ÷ 4 = ___

- Children use knowledge of known multiplication tables (2, 3, 5 and 10 times tables) and understanding of key concepts of multiplication to develop knowledge of the 4 times table. Children who have learnt 3 x 4 = 12 can use the understanding of commutativity to know that 4 x 3 = 12.
- Use the pictorial representations to complete the calculations:

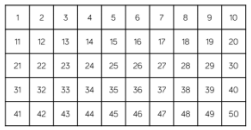
1 × 4 = ___

2 × 4 = ___

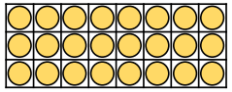
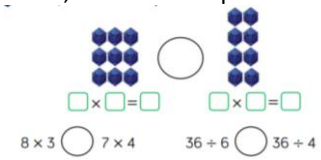
3 × 4 = ___

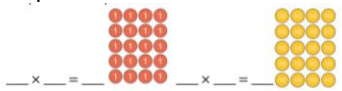
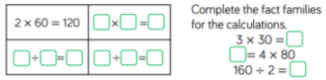
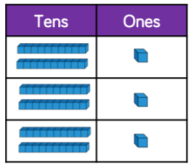
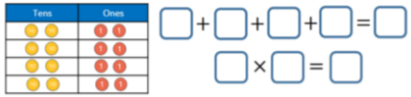
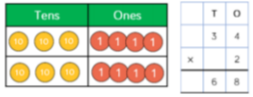
 Continue the pattern.

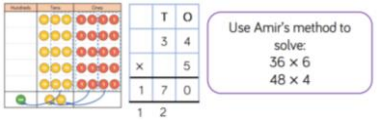
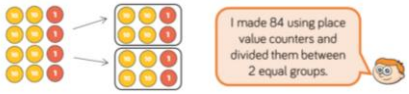
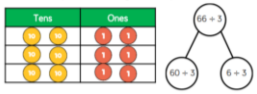
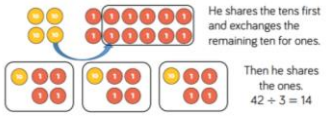
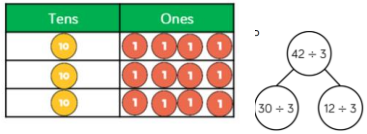
- 2 cars have eight wheels. How many wheels do 4 cars have? 2 x 4 = 8, 4 x 4 =
- Three cows have 12 legs. How many legs do six cows have? 3 x ___ = 12, 6 x ___ = 12
- Colour in the multiples of 4. What do you notice?

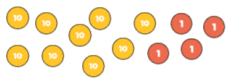
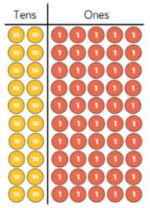
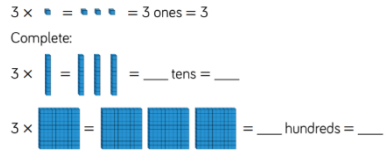


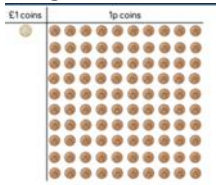
- Building on their knowledge of the 4 times table, children start to multiply by 8, understanding that each multiple of 8 is double the equivalent of 4. They link multiplying by eight to previous knowledge of equal groups and repeated addition. Children explore the concept of multiplying by 8 in different ways, when 8 is the multiplier (first number in the multiplication calculation) and where is 8 is the multiplicand (second number)
- How many legs do 4 spiders have?

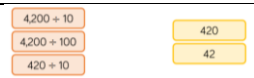
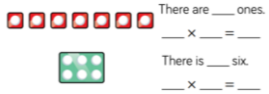
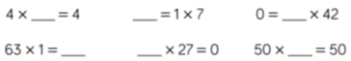
		 There are ___ legs on each spider. ___ + ___ + ___ + ___ = ___ ___ × 8 = ___ If there are ___ spiders, there will be ___ legs altogether. • Arrange 24 counters in an array as shown and complete the calculations:  ___ + ___ + ___ = ___ × ___ ___ + ___ + ___ + ___ + ___ + ___ + ___ + ___ = ___ × ___ • Children explore dividing by 8 through sharing into eight equal groups and grouping in eights. They use concrete and pictorial representations and their knowledge of inverse operations to check their answers. • There are 32 children in a PE lesson. They are split into 8 equal teams for a relay race. How many children are in each team? Use counters or multi-link to represent each child. There are ___ teams with ___ children in each team • Crayons are sold in packs of 8. Year 3 need 48 crayons. How many packs should be ordered? • They should order ___ packs of crayons. • Complete: 80 ÷ 8 = ___ 8 = 72 ÷ ___ 64 ÷ 8 = ___ 8 × ___ = 40 ___ × 8 = 24 ___ ÷ 8 = 7	
	To be able to compare multiplication and division statements	• Children use their knowledge of multiplication and division facts to compare statemtns using inequality symbols. It is important that children are exposed to a variety of representations of multiplication and division, including arrays and repeated addition. • Use <, > or = to compare:  □ × □ = □ □ × □ = □ 8 × 3 ◯ 7 × 4 36 ÷ 6 ◯ 36 ÷ 4 • Complete the number sentences: 5 × 1 < ____ × ____ 4 × 3 = ____ ÷ 3	
	To use known calculation facts to solve other multiplication problems	• Children use known multiplication facts to solve other multiplication problems. They understand that because one of the numbers in the calculation is ten times bigger, then	

	To be able to multiply 2-digits by 1-digit	the answer will be ten times bigger. It is important that children develop their conceptual understanding through the use of concrete manipulatives. • Complete the multilocation facts:  • The numcion pieces represent 5 x ___ = ____  If each hole was worth ten, what do the numicon pieces represent? • If we know that 2 x 6 – 12, we also know that 2 x 60 – 120. Use this to complete the facts family:  • Children use their understanding of repeated addition to represent a two-digit number multiplied by a one-digit number with concrete manipulatives. They use the formal method of column multiplication alongside the concrete representation. They also apply their understanding of portioning to represent and solve calculations. In this step, children explore multiplication with no exchange. • There are 21 coloured balls on a snooker table. How many coloured balls are there on 3 snooker tables?  Use Base 10 to work out 21 x 4 and 33 x 3 • Complete the calculations to match the place value counters:  • Annie uses place value counters to work out 34 x 2  Use Annie's method to solve 23 x 3, 32 x 3, 42 x 2 etc • Children continue to use their understanding of repeated addition to represent a two-digit number multiplied by a one-digit number with concrete manipulatives. They move onto explore multiplication with exchange. • Jack uses Base 10 to calculate 24 x 4	

	To be able to multiply 2-digits by 1-digit with carrying	 • Amir uses place value counters to calculate 16 x 4  • Amir then calculates 5 x 34 	
	To be able to divide 2-digits by 1-digit with no remainders	• Children divide 2-digit numbers by a 1-digit number by partitioning into tens and ones and sharing into equal groups. They divide numbers that do not involve exchange or remainders. It is important that children divide the tens first and then the ones. • Ron uses place value counters to solve 84÷2  Use Ron's method to calculate: 84÷4 66÷2 66÷3 • Ava uses a place value grid and part-whole model to solve 66÷3  Use Ava's method to calculate: 69÷3 96÷3 86÷2 • Children divide 2-digit numbers by 1 -digit number by partitioning into tens and ones and sharing into equal groups. They divide numbers that involve exchanging between the tens and ones. The answers do not have remainders. Children use their times tables to partition into multiples of the divisor. • Ron uses place value counters to divide 42 into three equal groups.  Use this method to calculate 48÷3 52÷4 96÷8 • Annie uses a similar method to divide 42 by 3  Use this method to calculate: 96÷8 96÷4 96÷3 96÷6	

	To be able to divide 2-digits by 1-digit with remainders	• Children move onto solving division problems with a remainder. You should make links between division and repeated subtraction. You will need to explain what remainders means to the children. • How many squares can you make with 13 lollipop sticks? There are ____ lollipop sticks There are ____ groups of 4 There is ____ lollipop stick remaining 13÷4= ____ remainder ____ Use this method to see how many triangles you can make with 38 lollipop sticks • Tommy uses repeated subtraction to solve 31÷4  $31 \div 4 = 7 \text{ r } 3$ Sue tommy's method to solve 38 divided by 3 • Use place value counters to work out 94÷4. Did you need to exchange any tens for ones? Is there a remainder?  Tens / Ones	
Milestone 4	To revise multiplying by 10 To be able to multiply by 100	• Children need to be able to visualise and understand making a number ten times bigger and that 'ten times bigger' is the same as 'multiply by 10'. The language of 'ten lots' is vital in this step. The understanding of the commutative law is essential because children need to see calculations such as 10 x 3 and 3 x 10 is equal. • Write the calculation shown by the place value counters: Each row has ___ tens and ___ ones Each row has a value of _____ There are _____ rows. The calculation is ___ x ___ = ____  Tens / Ones • Use place value counters to calculate: 10 x 3 4x10 12x10 • Children build on multiplying by 10 and see links between multiplying by 10 and multiplying by 100. Use place value counters and base 10 to explore what is happening to the value of the digits in the calculation and encourage children to see a rule so they can begin to move away from concrete representations. •  $3 \times$ ▪ = ▪▪▪ = 3 ones = 3 Complete: $3 \times$ ▮ = ▮▮▮ = ___ tens = ___ $3 \times$ ▦ = ▦▦▦ = ___ hundreds = ___	

		• Use a place value grid and counters to calculate: 7 x 10 63 x 10 80 x 10 7 x 100 63 x 100 80 x 100 What is the same and what is different about multiplying by 10 and by 100? • Use <,> or = to make the statements correct: 75 × 100 ◯ 75 × 10 39 × 100 ◯ 39 × 10 × 10 460 × 10 ◯ 100 × 47	
	To be able to divide by 10	• Exploring questions with whole number answers only, children divide by 10. They should use concrete manipulatives and place value charts to see the link between dividing by 10 and the position of the digits before and after the calculation. Using concrete resources, children should begin to understand the relationships between multiplying and dividing by 10 as the inverse of the other. • Use place value counters to show the steps to divide 30 by 10  • Use Base 10 to divide 140 by 10. Explain what you have done.  • Ten friends empty a money box. They share the money equally between them. How much would they have if the box contained: ○ 20 £1 coins? ○ £120? ○ £24? After emptying the box and sharing the contents equally, each friend has 90p. How much money was in the box?	
	To be able to divide by 100	• Children divide by 100 with whole number answers. Money and measure is good for real-life context for this, as coins can be used for the concrete stage. • Is it possible for £1 to be shared equally between 100 people? How does this picture explain it? Can £2 be shared equally between 100 people? How much would each person receive?  • Match the calculation with the correct answer	

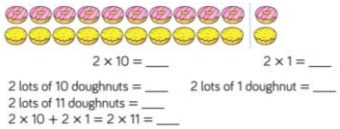
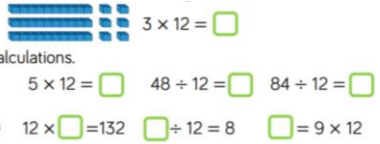
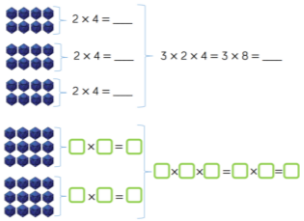
		 • Use <,> or = to make each statement correct: 
	To be able to multiply by 1 and 0	• Children explore the result of multiplying by 1, using concrete equipment. Linked to this, they look at multiplying by 0 and use concrete equipment and pictorial representations of multiplying by 0 • Complete the calculation shown by the number pieces  • Complete the sentences  There are ____ plates. There is ___ banana on each plate. Altogether there are ___ bananas. ____ x _____ = _____ • Complete: 

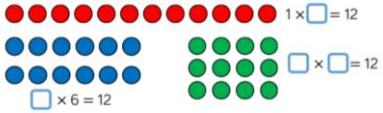
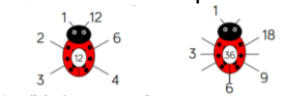
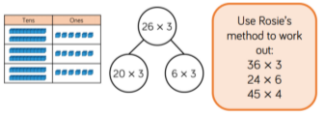
	To be able to divide by 1	• Children learn what happens to a number when you divide it by 1 or by itself. Using concrete and pictorial representations, children demonstrate how both the sharing and grouping structures of division can be sued to divide a number by 1 or itself. Use stem sentence to encourage children to see this e.g. 5 grouped into 5s equals 1 (5÷5 =1). 5 grouped into 1s equals 5 (5÷1=5)
		• Use counters and hands to complete:
		  • 4 counters **shared** between 4 hands ___ ÷ ___ = ___
		  • 4 counters **shared** between 1 hand ___ ÷ ___ = ___
		  • 9 counters **grouped** in 1s ___ ÷ ___ = ___
		  • 9 counters **grouped** in 9s ___ ÷ ___ = ___

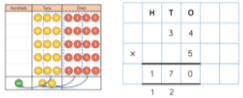
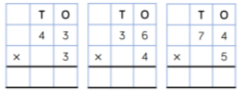
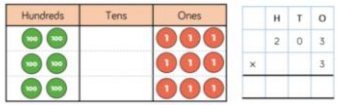
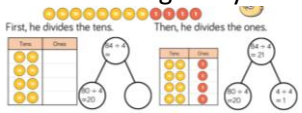
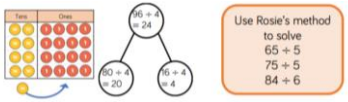
	To be able to recall multiplication and division facts for multiplication tables up 10 12 x 12 NB chn will focus on x6 x9 x7 x11 x12	• Children draw on their knowledge of times table facts in order to multiply and divide by 6. They use their knowledge of equal groups in using concrete and pictorial methods to solve multiplication and division problems.

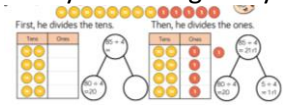
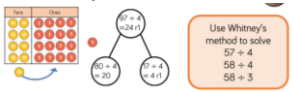
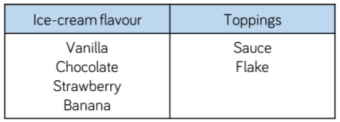
		• Complete the sentences:  There are ___ lots of ___ eggs. There are ___ eggs in total. ___ × ___ = ___ First there were ___ eggs. Then they were shared into ___ boxes. Now there are ___ eggs in each box. ___ ÷ ___ = ___ • Complete the fact family:  ___ × ___ = ___ ___ × ___ = ___ ___ ÷ ___ = ___ ___ ÷ ___ = ___ • There are 9 baskets. Each basket has 6 apples in. How many apples are there in total? Write a multiplication sentences to describe this word problem. • Children use known table facts to become fluent in the six times table. For example, applying knowledge of the 3 times by understanding that each multiple of 6 is double the equivalent multiple of 3. Children should also be able to apply this knowledge to multiplying and dividing by 10 and 100 (for example, knowing that 30 x 6 = 180 because they know that 3 x 6 – 18). • Complete the number sentences: 1 × 3 = ___ 1 × ___ = 6 2 × ___ = 6 2 × 6 = ___ 3 × 3 = ___ 3 × 6 = ___ • Use your knowledge of the 6 times table to complete the missing values: 6 × 2 = ___ ___ × 6 = 12 6 × 2 × 10 = ___ ___ × 20 = 120 20 × ___ = 120 6 × 2 × ___ = 1,200 6 × ___ = 1,200 200 × 6 = ___ 10 × ___ × 6 = 120 • Children use their previous knowledge of multiplying and dividing to become fluent in the 9 times table. They apply their knowledge in different contexts. • Complete the number sentences to describe the oranges: There are ___ lots of 9 There are ___ nines. 4 × ___ = ___  • Complete the fact family:  ___ × ___ = ___ ___ × ___ = ___ ___ ÷ ___ = ___ ___ ÷ ___ = ___ • Children use known times table facts to become fluent in the 9 times table. Children should also be able to apply the knowledge of the 9 times table when multiplying and dividing by 10 and 100. • What are the missing numbers from the 9 times table?	

		9 18 27 _____ 45 54 ____ 72 81 90 Circle the multiples of 9 54 108 18 24 9 67 72 37 • Use your knowledge of the 9 times table to complete the missing values: $1 \times 9 = \_\_\_$ $\_\_\_ \times 1 = 9$ $1 \times 9 \times \_\_\_ = 90$ $\_\_\_ \times 9 = 90$ $900 = 100 \times \_\_\_$ $9 \times 1 \times 10 = \_\_\_$ $9 \times \_\_\_ = 900$ $4 \times 9 = \_\_\_$ $9 \times 1 \times \_\_\_ = 900$ • Children use their knowledge of multiplication and division to multiply by 7. They count in 7s and use their knowledge of equal groups supported by use of concrete and pictorial methods to solve multiplication calculations and problems. They explore commutativity and also understand that multiplication and division are inverse operations. • Use a number stick to support counting in sevens. What do you notice? Write down the first 5 multiples of 7 ___ ___ ___ ___ ___ • Rosie uses numcion to represent seven times four. She does it in two ways. 4 sevens 4 lots of 7 4 × 7  7 fours 7 lots of 4 7 × 4  Use Rosie's method to represent seven times six in two ways. • Seven children share 56 stickers. How many stickers will they get each? Use a bar model to solve the problem. • One apple costs 7 pence. How much would 5 apples cost? Use a bar model to solve the problems. • Children apply the facts from the 7 times table to solve calculations with larger numbers. • Complete: 3 x 7 = 30 x 7 = 300 x 7= • Use your knowledge of the 7 times table to calculate: 80 x 7=____ 70 x 7=____ _____=60 x 7 7 x 500=____ • How would you use the 7 times table facts to help you calculate how many days there are in 15 weeks? Complete the sentences: There are ____days in one week ____x10=____ There are ____days in 10 weeks _____x 5=____ There are ____ days in 5 weeks ____ + ___ = ____ There are _____ days in 15 weeks	

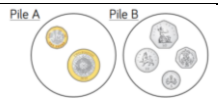
	To be able to multiply 3 numbers	• Building on their knowledge of the 1,2 and 10 times tables, children explore the 11 and 12 times tables through partitioning. They use Base 10 equipment to build representations of the times-tables and use them to explore the inverse of multiplication and division statements. Highlight the importance of commutativity as children should already know the majority of facts from other times-tables. • Fill in the blanks:  • Use Base 10 to build the 12 times table e.g.  • There are 11 players on a football team. 7 teams take part in a tournament. How many players are there altogether in the tournament?
	To be able to multiply 3 numbers	• Children are introduced to the 'Associative Law' to multiply 3 numbers. The law focuses on the idea that it does not mater how we group the numbers when we multiply e.g. 4 x 5 x 2 = (4 x 5) x 2 = 20 x 2 = 40 or 4 x 5 x 2 = 4 x (5 x 2) = 4 x 10 = 40. They link this idea to commutativity and see that we can change the order of the numbers to group them more efficiently e.g. 4 x 2 x 5 = (4x2) x 5 = 8 x 5 =40 • Complete the calculations:  • Use counters or cubes to represent the calculations. Choose which order you will complete the multiplication: 5x2x6 8x4x5 2x8x6
	To know factor pairs	• Children learn that a factor pair is a whole number that multiplies by another number to make a product e.g. 3 x 5 = 15, factor x factor = product. They develop

		their understanding of factor pairs using concrete resources to work systematically e.g. factor pairs for 12 – begin with 1 x 12, 2 x 6, 3 x 4. At this stage, children recognise that they have already used 4 in the previous calculation there fore all factor pairs have been found. • Complete the factor pairs for 12  12 has ___ factor pairs. 12 has ___ factors altogether. Use counters to create arrays for 24 How many factor pairs can you find? • Here is an example of a factor bug for 12. Complete the factor bug for 36.  Draw your own factor bugs for 16, 48, 56 and 35	
	To use informal written methods for multiplication	• Children use a variety of informal written methods to multiply a two-digit and a one-digit number. • There are 8 classes in a school. Each calss has 26 children. How many children are there altogether? Complete the number line to solve the problem.  Use this method to work out: 16 x 7 34 x 6 27 x 4 • Rosie uses Base 10 and a part-whole model to calculate 26 x 3. Complete Rosie's calculations:  	
	To multiply 2 digits by 1-digit	• Children build on their understanding of formal multiplication from year 3 to move tp the formal short multiplication method. Children use knowledge of exchanging ten ones for one ten in addition and apply this to multiplication, including exchanging multiple groups of tens. They use place value counters to support their understanding. • Whitney uses place value counters to calculate 5 x 34  	

	To multiply 3-digits by 1-digit	• Ron also uses place value counters to calculate 5 x 34  • Use Ron's method to complete:  • Children build on previous steps to represent a three-digit number multiplied by a one digit number with concrete manipulatives. Highlight misconceptions of 0 in the tens or ones column. Children continue to exchange groups of ten ones for tens and record this in a written method. • Complete the calculation:  • A school house has 4 teams. There are 245 children in each house team. How many children are there altogether? 	
	To divide 2-digits by 1 digit	• Children build on their knowledge of dividing a 2-digit number by a 1-digit number from year 3 by sharing into equal groups. Children use examples where the tens and the ones are divisible by the divisor e.g. 96 divided by 3 and 84 divided by 4. They then move on to calculations where they exchange between tens and ones. • Jack is dividing 84 by 4 using place value counters  Use Jack's method to calculate: 69 ÷3 88÷4 96÷3 • Rosie is calculating 96 divided by 4 using place value counters. First, she divides the tens. She has one ten remaining so she exchanges one ten for ten ones. The she divides the ones 	

		• Children explore dividing 2-digit numbers by 1-digit numbers involving remainders. They continue to use place value counters to divide in order to explore why there are remainders. Highlight that the remainder can never be greater than the number you are dividing by. • Teddy is dividing 85 by 4 using place value counters  Use this method to calculate: 86 ÷4 87÷4 97÷3 98÷3 • Whitney uses the same method but some of her calculations involve an exchange 	
	To divide 3 digits by 1 digit	• Children apply their previous knowledge of dividing 2-digit numbers to divide a 3-digit number by 1 digit number. They use place value counters and part whole models to support their understanding. Children divide numbers with and without remainders. • Annie is dividing 609 by 3 using place value counters  Use Annie's method to calculate: 906 ÷ 3 884÷4 884÷8 489÷2	
	To use correspondence	• Children solve more complex problems working out when *n* objects relate to *m* objects. They find all solutions and notice how to use multiplication facts to solve problems. • An ice cream van has 4 flavours of ice cream and 2 choices of toppings.  How many different combinations of ice cream and toppings can be made? Complete the multiplication to represent the combinations. ___ x ___ = ___. There are ___ combinations. • Jack has two piles of coins. He chooses one coin from each pile.	

Ice-cream flavour	Toppings
Vanilla Chocolate Strawberry Banana	Sauce Flake

		 What are all the possible combinations of coins Jack can choose? What are all the possible totals he can make?	