North Road Community Primary School

Enjoy learning, succeed in life

North Road Community Primary School
Maths and Progression in Calculation Policy
November 2020

Why do we learn mathematics at North Road?

Mathematics teaches children how to make sense of the world around them through developing their ability to calculate, reason and solve problems. At North Road we believe that **all** children can achieve in maths through self-belief and effort and encourage a 'can do' attitude at all times.

We promote enjoyment of learning through practical activity, exploration and discussion and encourage children to understand the importance of mathematics in everyday life, whether it be calculating change or percentage decreases when shopping, weighing precise amounts of ingredients when following a recipe or measuring a specific area of flooring to carpet.

What does maths look like at North Road?

Our main aim at North Road is to promote confidence and competence in maths by creating a positive learning environment where the children are not afraid to make mistakes and are encouraged to use the 'Power of YET' if they are unsure of a mathematical concept.

We want our children to become fluent in solving calculations with the four rules of number and seek to provide them with a variety of strategies to enable them solve a range of problems.

Small steps, and a style of teaching, whereby we adopt an 'I do/we do/you do' approach, are encouraged and supported and we ensure there is challenge for all children through our 'Try it!' 'Use it!' 'Deepen it!' teaching sequence.

'Try it' tasks aim to improve the children's fluency of the skill.

'Use it' tasks challenge the children to draw on and apply the skills they have achieved in the 'Try it' tasks.

'Deepen it' tasks require the children to explain their understanding.

We encourage the use of practical equipment and visual images, such as Numicon, Base 10, number lines and the bar model, to support the children's learning and make the maths teaching accessible to all. Through mathematical talk, we encourage children to develop the ability to articulate, discuss and reason their mathematical thinking.

Progression in the use of manipulatives to support learning

Foundation	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects	Real-life objects
0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards	0 – 9 digit cards
Number track to 10	Number line to 20	Number line to 100	Number line to 100	Number line including negative numbers	Number line including negative numbers	Number line including negative numbers
Numbered counting stick	Counting stick	Counting stick	Counting stick	Counting stick	Counting stick	Counting stick
Tens frame	Tens frame	Tens frame				
	Place value charts – Tens and ones	Place value charts – Hundreds, tens and ones	Place value charts – Thousands, hundreds, tens and ones	Place value charts – Ten thousands, thousands, hundreds, tens, ones and tenths	Place value charts to a million and three decimal places	Place value charts to 10 million and three decimal places
Interlocking cubes - Use one colour to represent one amount	Interlocking cubes - Use one colour to represent one amount	Dienes	Dienes	Dienes	Dienes	Dienes
			Place value counters	Place value counters	Place value counters	Place value counters
	Place value arrow cards – tens and ones	Place value arrow cards – tens and ones	Place value arrow cards – H, T, O	Place value arrow cards – Th, H, T, O	Place value arrow cards	Place value arrow cards
Part-part-whole mat	Part-part-whole mat	Part-part-whole mat	Part-part-whole model	Part-part-whole model	Part-part-whole model	Part-part-whole model
Bar model with real-life objects	Bar model with real life objects/pictorial objects/representative objects e.g. counters	Bar model with counters /Dienes progressing to numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers	Bar model with numbers
Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes	Numicon shapes
			Cuisenaire rods	Cuisenaire rods	Cuisenaire rods	Cuisenaire rods
Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount	Multilink – use one colour to model an amount

Classroom/Learning Wall visual prompts

Foundation	Year 1/2		Year 3/4		Year 5/6
Big focus 10	Big focus 20	Big focus 100			
Numicon number line with Numicon shapes	Numicon number line with Numicon shapes	Numicon number line	Fractions number line	Fractions and decimals number line	Fractions, decimals and percentages number line
	Odd and even numbers				Prime, square and cube numbers
	Number pairs totaling 10 Number pairs totaling 20	Multiples of 10 totaling 100	Number pairs totaling 10 Multiples of 10 totaling 100		
0 – 10 number line / track	0 -20 number line	0 – 100 number line	Number line including negative numbers		Number line including negative numbers
	100 square		100 square		
Real coins Large coins	Real coins Large coins		Real coins Large coins		Real coins Large coins
	1, 2, 5 and 10 times tables	3 and 4times tables	All times tables up to 12 x 12		All times tables up to 12 x 12
			Roman numerals		Roman numerals
		< , > and = signs	< , > and = signs		<, > and = signs
Real-life / pictorial fractions	Real-life / pictorial fractions	Fractions including fraction number line/wall	Fractions including fraction number line/wall		Fractions, decimals and percentages including fraction number line/wall
					BIDMAS
2d and 3d shapes	2d and 3d shapes		2d and 3d shapes		2d and 3d shapes

Progression in the teaching of counting in EYFS

Pre-counting

The key focus in pre-counting is an understanding of the concepts more, less and the same and an appreciation of how these are related. Children at this stage develop these concepts by comparison and no counting is involved.

Ordering

Count by reciting the number names in order forwards and backwards from any starting point.

One to one correspondence

One number word has to be matched to each and every object.

Lack of coordination is a source of potential error – it helps if children move the objects as they count, use large rhythmic movements, or clap as they count

Cardinality (Knowing the final number counted is the total number of objects)

Count out a number of objects from a larger collection. Know the number they stop counting at will give the total number of objects.

Pre-counting ideas

Provide children with opportunities to sort groups of objects explicitly using the language of more and less

Which group of apples has the most? Which group of apples has the least?

Ordering ideas

Provide children with opportunities to count orally on a daily basis. Rote count so that children are able to understand number order and can hear the rhythm and pattern. Use a drum or clap to keep the beat.

One to one correspondence ideas

Play counting games together moving along a track, play games involving amounts such as knocking down skittles.

Use traditional counting songs throughout the day ensuring children have the visual/kinesthetic resources e.g. 5 little ducks, 10 green bottles

Cardinal counting ideas

How many bananas are in my fruit bowl? Allow children to physically handle the fruit. Provide children with objects to point to and move as they count and say the numbers.

Progression in the teaching of counting in EYFS

Subitising (recognise small numbers without counting them)	Abstraction	Conservation of number	End of year counting expectations
Children need to recognize small amounts without counting them e.g. dot patterns on dice, dots on tens frames, dominoes and playing cards as well as small groups of randomly arranged shapes stuck on cards.	You can count anything – visible objects, hidden objects, imaginary objects, sounds etc. Children find it harder to count things they cannot move (because the objects are fixed), touch (they are at a distance), see that move around. Children also find it difficult to count a mix of different objects, or similar objects of very different sizes.	Ultimately children need to realise that when objects are rearranged the number of them stays the same.	- count reliably to 20 - count reliably up to 10 everyday objects - estimate a number of objects then check by counting - use ordinal numbers in context e.g. first, second, third - count in twos, fives and tens - order numbers 1-20 - say 1 more/ 1 less than a given number to 20
Subitising ideas Provide children with opportunities to count by recognising amounts 	**Abstraction ideas** *How many pigs are in this picture?* ***Provide children with a variety of objects to count***	**Conservation of number** The amount is 'five' and doesn't change. 	
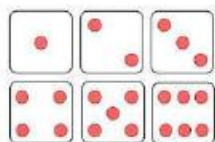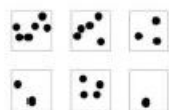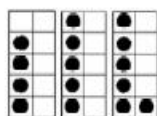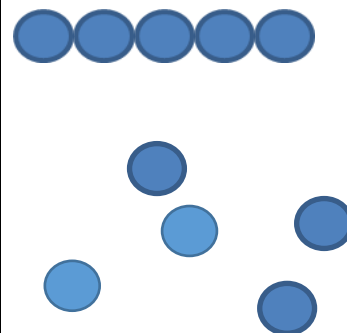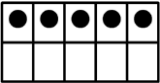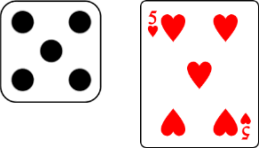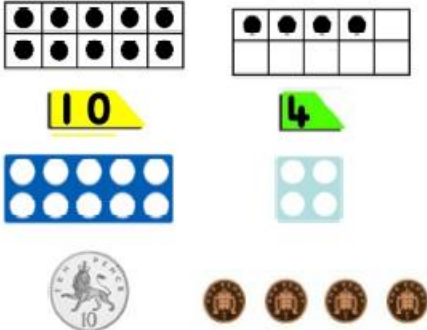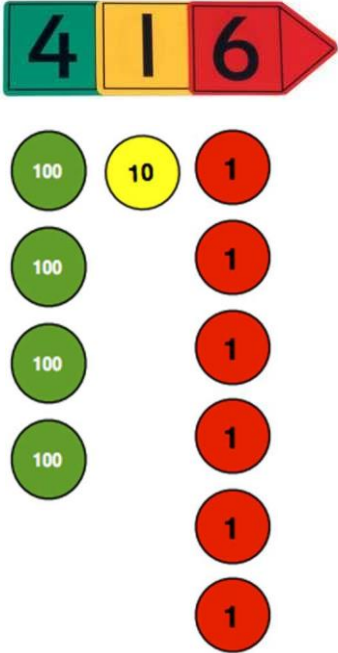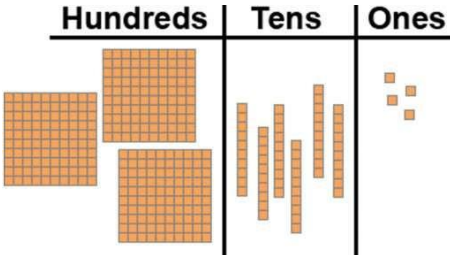
Progression in the teaching of place value

Foundation Understanding ten	Y1 Understanding numbers up to 20	Y2 Understanding numbers up to one hundred	Y3 Understanding numbers up to one thousand
Use **tens frames** flash cards daily to ensure children recognise amounts. Use empty **tens frames** to fill with counters to enable children to understand number relationships. Either fill the **tens frame** in pairs or in rows. In rows shows 5 as a benchmark. Children can easily see more than 5 or less. Include other visual images such as dice, cards, dominoes etc.	Ten-frames provide a first step into understanding two-digit numbers simply by the introduction of a second frame. Placing the second frame to the right of the first frame, and later introducing numeral cards, will further assist the development of place- value understanding.	Continue developing place value through the use of **tens frames**.	Continue developing place value through the use of manipulatives. Use Dienes blocks and gattegno Charts
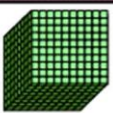
Progression in the teaching of place value

Y4 Understanding numbers up to ten thousand	Y5 Understanding numbers up to one million including decimals	Y6 Understanding numbers beyond one million including decimals
Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters • Dienes blocks • Gattegno Charts	Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters (including decimal counters) • Dienes blocks • Gattegno Charts	Continue developing place value through the use of manipulatives. • Place value arrow cards • Place value counters (including decimals counters) • Dienes blocks • Gattegno Charts
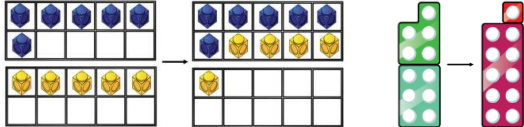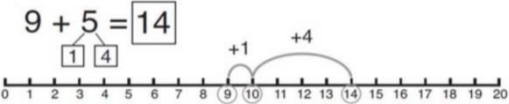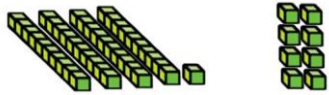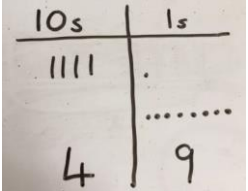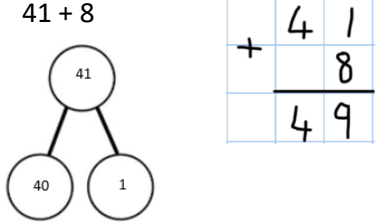
Progression in Addition

Objective and Strategies	Concrete Build it	Pictorial Draw it	Abstract Solve it	Vocabulary
Combining two parts to make a whole: part-whole model	 Counters represent real-life objects. Use cubes to add two numbers together as a group or in a bar.	 Part + Part = Whole Whole − Part = Part	 5 + 5 = 10 10 = 5 + 5 Five is a part, 5 is a part and the whole is 10.	Part – part – whole Calculation equation + total altogether increase sum (meaning total) plus add more and make double one more two (ten) more addition equals = is the same as hundred ten one exchange column column digit columnar column addition
Counting on using a number line	Using cubes or Numicon 	Counting on A bar model which encourages children to count on rather than count all. 	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? 4 + 2 	

Regrouping to make 10	Using ten frames and counters/cubes alongside Numicon 6 + 5 	Children to draw tens frame and counters. Use number line $9 + 5 = 14$ 	$7 + 4 = 11$ If am I at seven, how many more do I need to make 10? (Partitioning of numbers is a key skill) How many more do I add on now?	
TO + O	Continue to develop understanding of partitioning and place value. 41 + 8 	Children to represent the base 10 e.g. lines for tens and dots for ones. 	41 + 8 $1 + 8 = 9$ $40 + 9 = 49$	

| Column method- no regrouping | 43
+ 26
_____

Use Dienes to add tens and ones before moving on to place value counters.
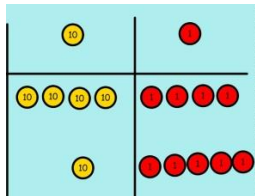
 | After practically using the base 10 blocks and place value counters, children can draw the counters/Dienes to help them to solve additions.
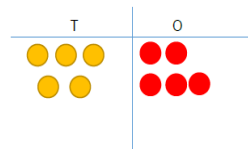
 | Calculations

21 + 42 =

21
+ 42 | |

Column method- regrouping	 6 1 When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred. 6 1 1	 6 1 Children to represent the counters in a place value chart, circling when they make an exchange. 6 1 1	Looking for ways to make 10. $36 + 25=$ $30 + 20 = 50$ $5 + 5 = 10$ $50 + 10 + 1 = 61$ 1 5 Formal method: $$\begin{array}{r} 36 \\ +25 \\ \hline 61 \\ {\scriptstyle 1} \end{array}$$ $$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ {\scriptstyle 1\ 1} \end{array}$$ As the children move on, introduce decimals with the same number of decimal places. $$\begin{array}{r} 72.8 \\ +54.6 \\ \hline 127.4 \\ {\scriptstyle 1\ 1} \end{array}$$ Then move onto decimals with a different number of decimal places. $$\begin{array}{r} 2\ \ 3\ .\ 3\ \ 6\ \ 1 \\ 9\ .\ 0\ \ 8\ \ \mathbf{0} \\ 5\ \ 9\ .\ 7\ \ 7\ \ \mathbf{0} \\ +\ \ 1\ .\ 3\ \ \mathbf{0}\ \ \mathbf{0} \\ \hline 9\ \ 3\ .\ 5\ \ 1\ \ 1 \\ {\scriptstyle 2\ \ 1\ \ \ \ \ 2} \end{array}$$	
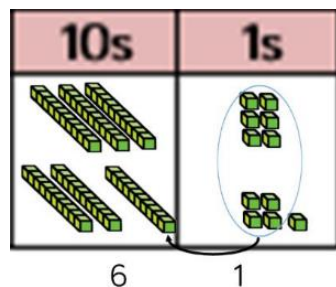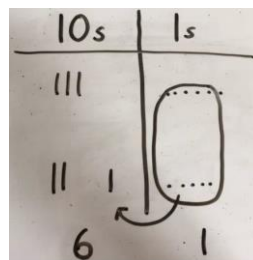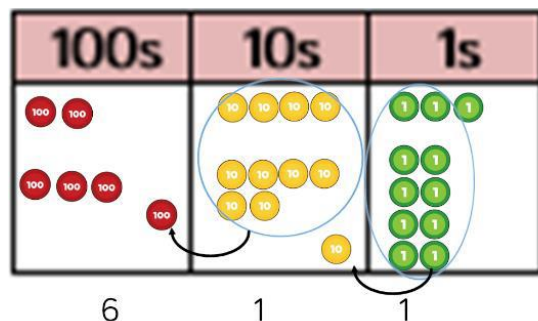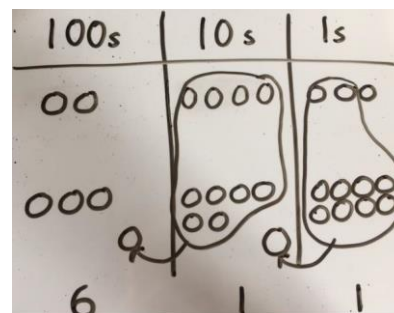
Add Fractions	Count in fraction steps using real objects and a number line.	Use the bar model to add fractions.	$$\frac{1}{4} + \frac{1}{3} =$$	

Count in fraction steps using real objects and a number line.

There are 4 sections in the 1 whole fraction bar.

$$\frac{1}{2} + \frac{1}{4} = \frac{3}{4}$$
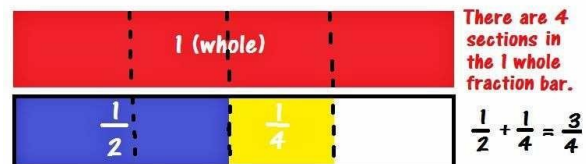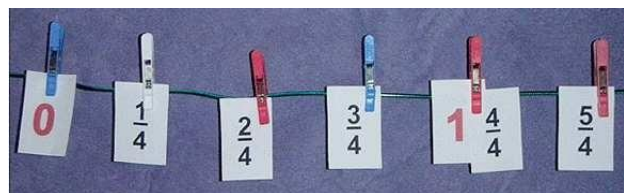
When I add the $\frac{1}{2}$ with the $\frac{1}{4}$ it matches the same space as three sections in the 'benchmark' one whole fraction bar.

LCD = least common denominator

Find the LCD of 2 and 4 so you have a common denominator. Convert then add the numerators.

$$\frac{1}{2} \overset{x2}{\underset{x2}{=}} \frac{2}{4}$$
$$+ \frac{1}{4} \overset{x1}{\underset{x1}{=}} \frac{1}{4}$$
$$\frac{3}{4}$$

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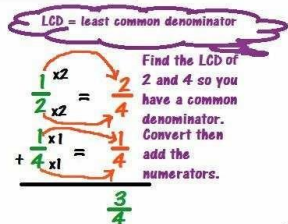
Use Numicon to add fractions.

$$2 + \frac{1}{3} = \frac{3}{3} + \frac{3}{3} + \frac{1}{3} = \frac{7}{3}$$

$$\frac{2}{5} + \frac{2}{5} + \frac{2}{5} = \frac{6}{5}$$

Use the bar model to add fractions.

$$\frac{1}{4} \quad + \quad \frac{1}{3}$$

$$\frac{1}{4} + \frac{1}{3}$$

$$\frac{1}{12} \quad \frac{1}{12} \quad \frac{1}{12}$$

$$\frac{1}{12} \quad \frac{1}{12} \quad \frac{1}{12} \quad \frac{1}{12}$$
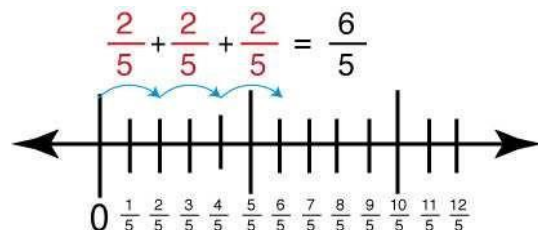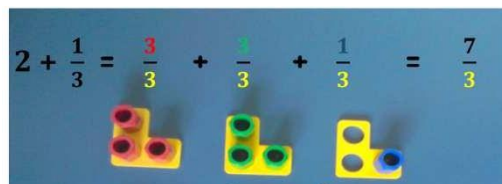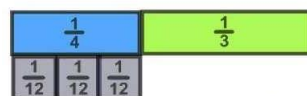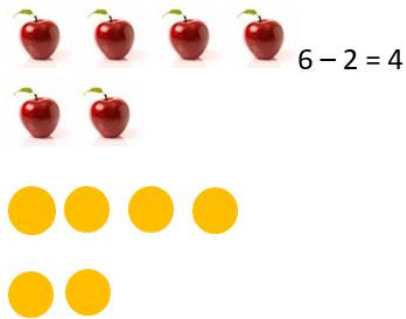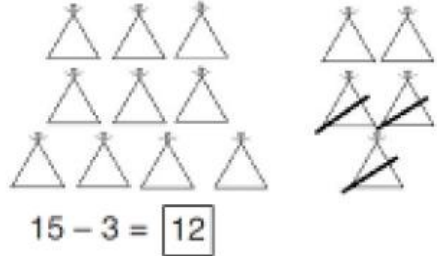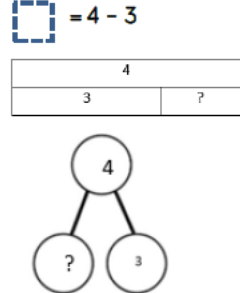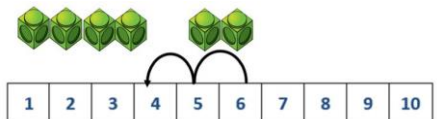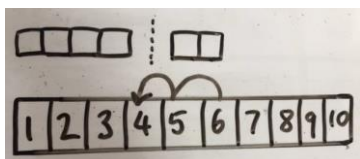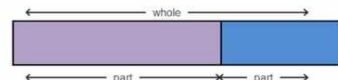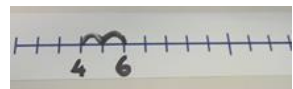
$$\frac{1}{4} + \frac{1}{3} =$$

$$\frac{1 \times 3}{4 \times 3} + \frac{1 \times 4}{3 \times 4}$$

$$\frac{3}{12} + \frac{4}{12} = \frac{7}{12}$$

Progression in Subtraction				
Objective and Strategies	**Concrete** Build it	**Pictorial** Draw it	**Abstract** Solve it	**Vocabulary**
Taking away ones	Use physical objects, counters, cubes etc. to show how objects can be taken away. $6 - 2 = 4$	Cross out drawn objects to show what has been taken away. $15 - 3 = \boxed{12}$	$4 - 3 =$ $\boxed{} = 4 - 3$	- Take (away) How many are left over? How many have gone? One less, two less etc. How many fewer is… than….? How much less is….? Difference between
Counting back using number lines or number tracks	Children start with 6 and count back 2. $6 - 2 = 4$ Use cubes to subtract a number from the bar.	Children to represent what they see pictorially e.g. Use the bar whole part part Part + Part = Whole Whole – Part = Part	Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line.	Subtract Subtraction minus order (commutative) calculate column subtraction estimate inverse operation

Find the difference	Compare amounts and objects to find the difference. Use cubes to make bars to find the difference. Use basic bar models with items to find the difference 5 Pencils 3 Erasers ?	Count on to find the difference. +6 Draw bars to find the difference between 2 numbers. **Comparison Bar Models** Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between them. 13 ? Lisa Sister 22	Find the difference between 8 and 5. $8 - 5$, the difference is ……. Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the number of sandwiches. Children to explore why $9 - 6 = 8 - 5 = 7 - 4$ have the same difference.	
Part Part Whole Model	 $10 - 6 =$	Link to addition- use the part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part?	Use a pictorial representation of objects to show the part part whole model. 	 5 10 Move to using numbers within the part whole model.	
Make 10	Using ten frames $14 - 9 =$ Make 14 on the ten frame. Take away the four first to make 10 and then takeaway one more so you have taken away 5. You are left with the answer of 9.	 $13 - 7 = 6$ 3 4 -4 -3 Start at 13. Take away 3 to reach 10. Then take away the remaining 4 so you have taken away 7 altogether. You have reached your answer.	Children to show how they can make 10 by partitioning the subtrahend. $14 - 5 = 9$ 4 1 $14 - 4 = 10$ $10 - 1 = 9$ $16 - 8 =$ How many do we take off to reach the next 10? How many do we have left to take off?	
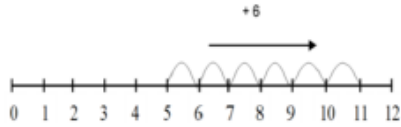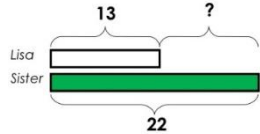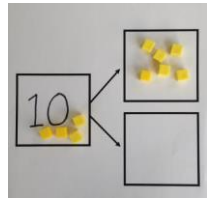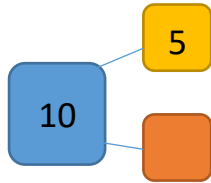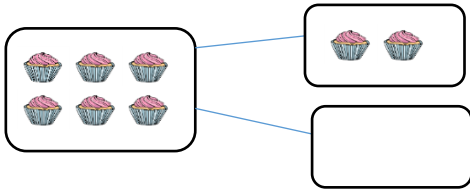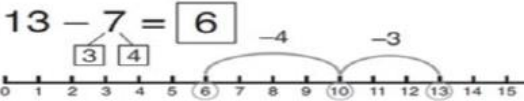
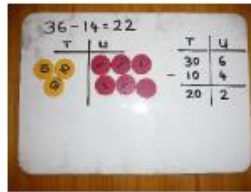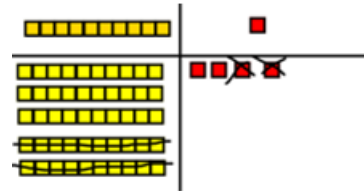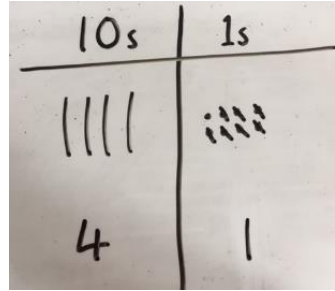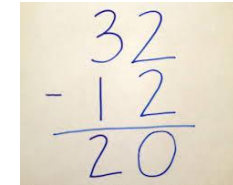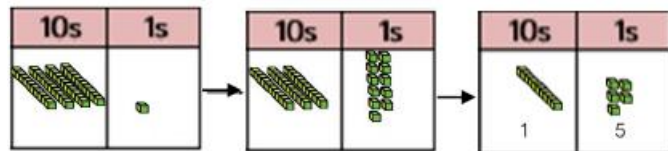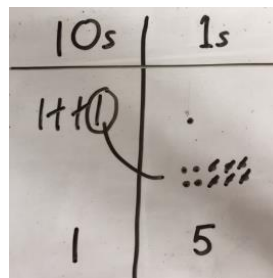|			
Column method without exchanging	48-7 **2 digit – 2 digit** Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again make the larger number first.	Children to represent the base 10 pictorially.	Column method *Note – children should be encouraged to use the most efficient method for calculating. 48 – 7 can be solved easily on a number line by counting back.*
Column method using base 10 and having to exchange.	41 – 26	Represent the base 10 pictorially, remembering to show the exchange.	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.
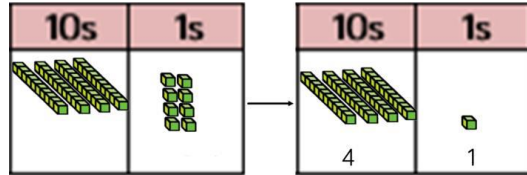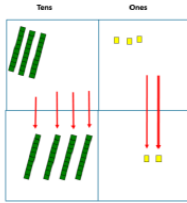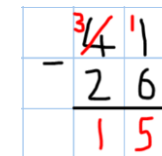
| Column method using place value counters. | 234 – 88
Make the larger number with the place value counters
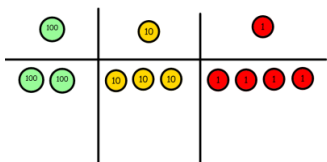
Start with the ones, can I take away 8 from 4 easily?

I need to exchange one of my tens for ten ones.

Now I can subtract my ones.
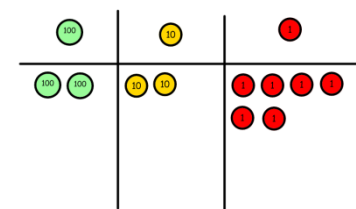
Now look at the tens, can I take away 8 tens easily?

I need to exchange one hundred for ten tens.
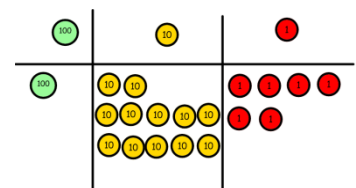
Now I can take away eight tens and complete my subtraction

Show children how the concrete method links to the written method alongside your working. Cross out the numbers when exchanging and show where we write our new amount. | Represent the place value counters pictorially; remembering to show what has been exchanged.
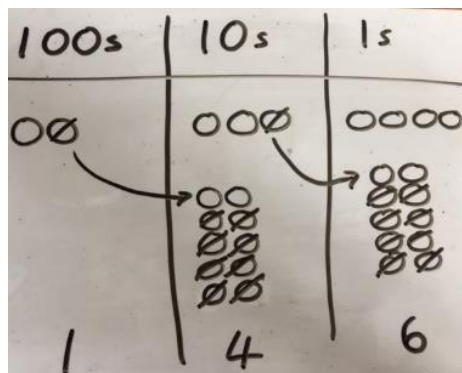
 | If needed, children can start their formal written method by partitioning the number into clear place value columns.

Moving forward the children use a more compact method.

This will lead to an understanding of subtracting any number including decimals.

 | |

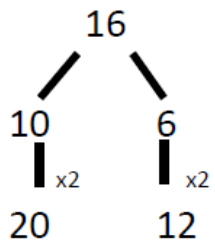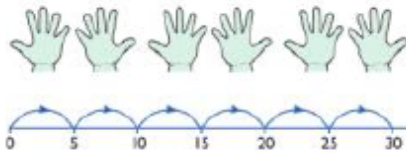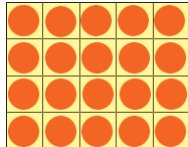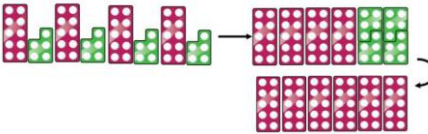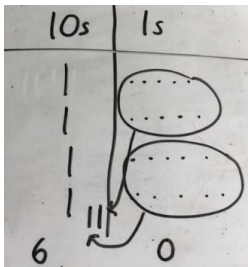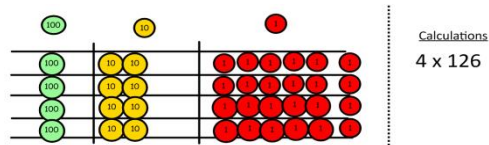| Subtract Fractions |

The cake has been divided into five slices. Each part is one fifth of the whole cake.

If there are five fifths and I eat one fifth, what fraction of the cake is left? | Draw a bar model to represent the cake.

Progress onto subtracting fractions with different denominators.
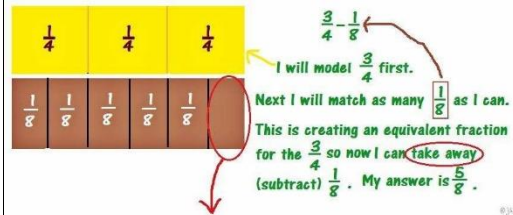
 | $\dfrac{5}{5} - \dfrac{1}{5} = \dfrac{4}{5}$
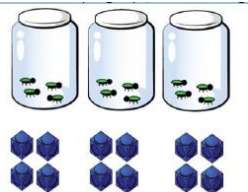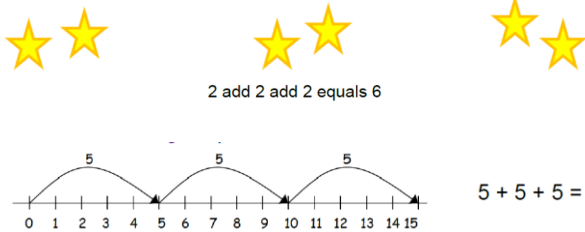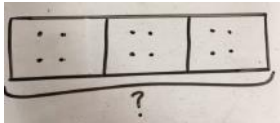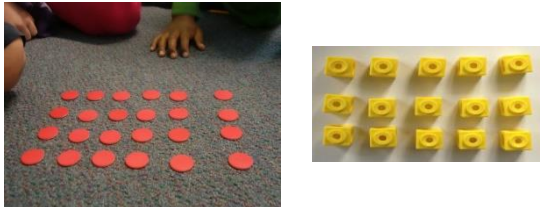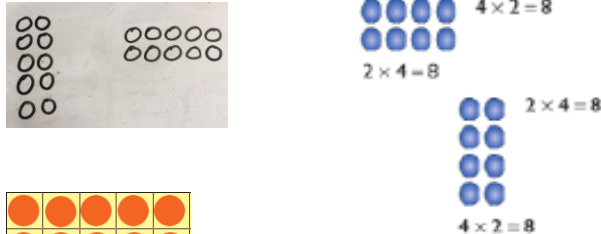
$\dfrac{3}{4} - \dfrac{1}{8} =$

$\dfrac{3\times2}{4\times2} - \dfrac{1}{8}$

$\dfrac{6}{8} - \dfrac{1}{8} = \dfrac{5}{8}$ | |

	Progression in Multiplication			
Objective and Strategies	Concrete Build it	Pictorial Draw it	Abstract Solve it	Vocabulary
Doubling	Use practical activities to show how to double a number. Double 5 is 10. 5 x 2 = 10	Draw pictures to show how to double a number. Double 4 is 8	Partition a number and then double each part before recombining it back together. 16 10 6 x2 x2 20 12	X Double pairs Doubling Multiplication Multiply Multiplied by Multiple Common multiple Array Row column Number pattern
Counting in multiples	Count in multiples supported by concrete objects in equal groups.	Use a number line or pictures to continue support in counting in multiples. 0 5 10 15 20 25 30	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30	Groups of Lots of Sets of Times Once, twice, three times…..twelve times Repeated addition How many

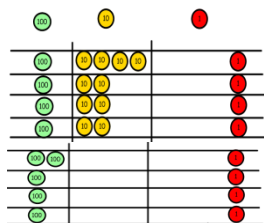|				
Repeated grouping - repeated addition	Use different objects to add equal groups. 3×4 $4 + 4 + 4$ There are 3 equal groups, with 4 in each group. 	Children to represent the practical resources in a picture and on a number line. There are 3 plates. Each plate has 2 star biscuits on. How many biscuits are there? 2 add 2 add 2 equals 6 $5 + 5 + 5 = 15$ When confident, use a bar model.	$3 \times 4 = 12$ $4 + 4 + 4 = 12$	altogether? Multiplication table Multiplication fact Fact family partition Scaling Scaled up/down Scale factor ratio Times larger/smaller Factor Factor pair Product multiplier Inverse Square/squared Cube/cubed Commutative Short/long multiplication
Arrays – showing commutative multiplication	Create arrays using counters/ cubes to show multiplication sentences. 	Draw arrays in different rotations to find **commutative** multiplication sentences. $4 \times 2 = 8$ $2 \times 4 = 8$ $2 \times 4 = 8$ $4 \times 2 = 8$ Link arrays to area of rectangles.	Use an array to write multiplication sentences and reinforce repeated addition. $15 = 3 \times 5$ $5 \times 3 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $15 = 5 + 5 + 5$	
Partition to multiply	Use Numicon, base 10, place value counters 4×15 4×13 	Children to represent the concrete manipulatives pictorially. 	Children to be encouraged to show the steps they have taken. 4×15 10 5 $10 \times 4 = 40$ $5 \times 4 = 20$ $40 + 20 = 60$	

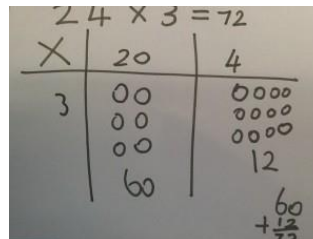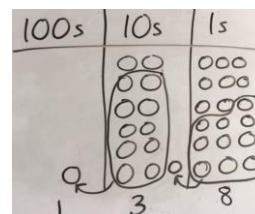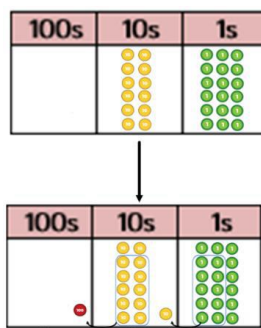|			
	Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows. Fill each row with 126. Add up each column, starting with the ones making any exchanges needed.	Children can represent the work they have done with place value counters in a way that they understand. They can draw the counters, using colours to show different amounts or just use circles in the different columns to show their thinking as shown below.	Start with multiplying by one digit numbers: Move forward, multiply by 2 digit number:

Calculations 4 x 126

Calculations 4 x 126

Table (multiply by one digit):

X	7
10	70
6	42
+	112

Area model:

	10	8
10	100	80
3	30	24

X	1000	300	40	2
10	10000	3000	400	20
8	8000	2400	320	16

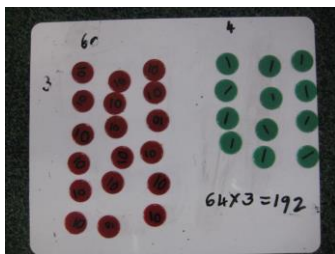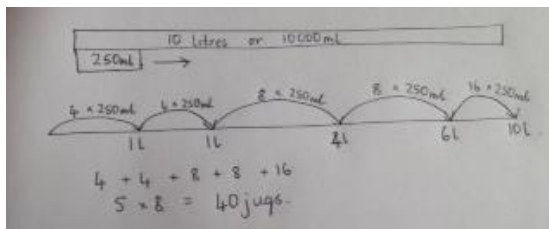| **Column multiplication** | Children can continue to be supported by place value counters at the stage of multiplication | Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods. | |

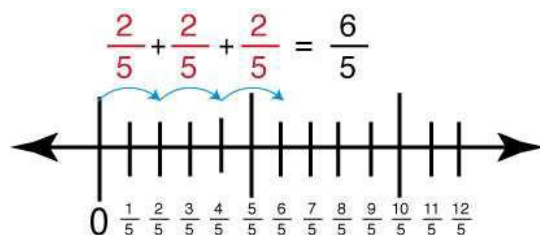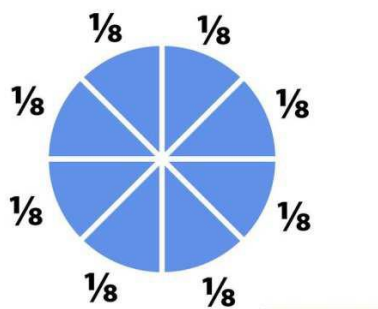|				
	64X3 =192		$$\begin{array}{r} {}^{1}{}^{2} \\ 1\ 2\ 4 \\ \times2\ 6 \\ \hline 2\ 4\ 8\ 0 \\ 7\ 4\ 4 \\ \hline 3\ 2\ 2\ 4 \\ 1\ \ 1 \end{array}$$ Answer: 3224	
	It is important at this stage that they always multiply the ones first and note down their answer followed by the tens which they note below.			
Multiplication of Fractions	Count in fraction steps (repeated addition) What would three lots of one eighth be? $$\frac{2}{5}+\frac{2}{5}+\frac{2}{5}=\frac{6}{5}$$	Use of bar model Three times one eighth	${}^{10}/_8 = 1\,{}^{2}/_8$		Multiply the numerators together then multiply the denominators. $$3 \times {}^{1}/_8 =$$ $$\frac{3}{1} \times \frac{1}{8} = \frac{3}{8}$$	
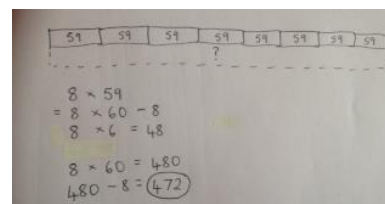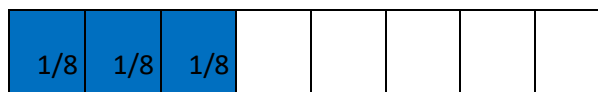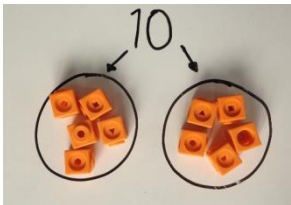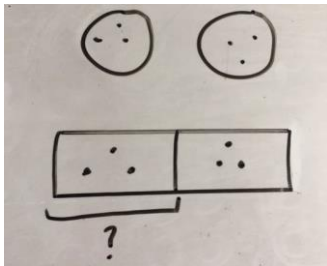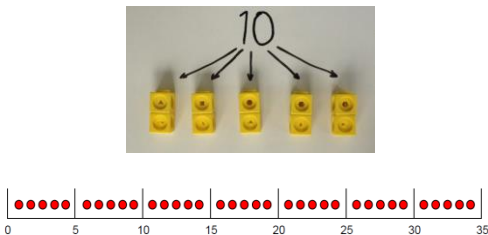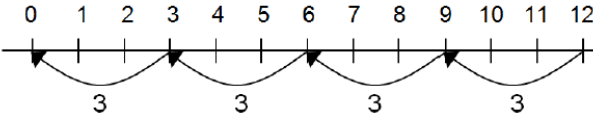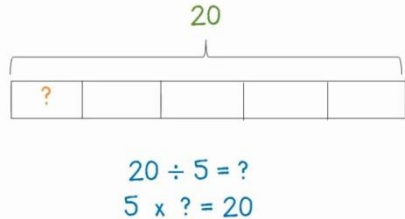
Bar model fraction list:
${}^{10}/_8 = 1\,{}^{2}/_8$
${}^{9}/_8 = 1\,{}^{1}/_8$
${}^{8}/_8 = 1$
${}^{7}/_8$
${}^{6}/_8$
${}^{5}/_8$
${}^{4}/_8 = {}^{1}/_2$
${}^{3}/_8$
${}^{2}/_8 = {}^{1}/_4$
${}^{1}/_8$

Progression in Division

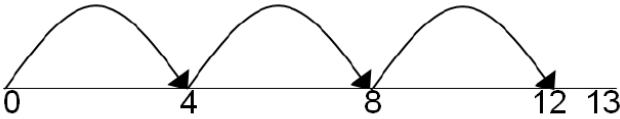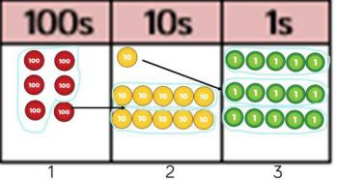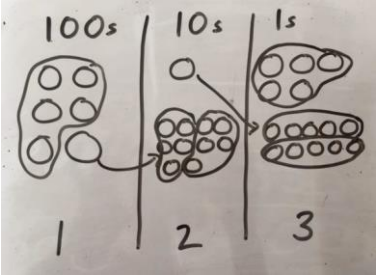| Objective and Strategies	Concrete Build it	Pictorial Draw it	Abstract Solve it	Vocabulary
Sharing objects in to groups	 I have 10 cubes, can you share them equally in 2 groups? If we are dividing by 2 we are finding a half.	Represent sharing pictorially 	One half of 14 is 7 ½ of 14 = 7 14 ÷ 2 = 7 Share 9 buns between three people. 9 ÷ 3 = 3	÷ divided by division divided into divide dividing divisible by repeated subtraction grouping and sharing share
Division as grouping – repeated subtraction	Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding. 96 ÷ 3 = 32 	Use a number line to show jumps in groups. The number of jumps equals the number of groups. Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group. 20 ÷ 5 = ? 5 x ? = 20	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?	shared between share equally equal equal groups equal to group groups of quotient divisor dividend remainder factor common factor factor pairs short division long division proportion per fair half halve how many even

Division with arrays	 Link division to multiplication by creating an array and thinking about the number sentences that can be created Eg 15 ÷ 3 = 5 5 x 3 = 15 15 ÷ 5 = 3 3 x 5 = 15	 Draw an array and use lines to split the array into groups to make multiplication and division sentences.	Find the inverse of multiplication and division sentences by creating four linking number sentences (fact families). 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7	parts whole represent problem fact family order commutative
Division with a remainder	14 ÷ 3 = Divide objects between groups and see how much is left over 	Jump forward in equal jumps on a number line then see how many more you need to jump to find a remainder. Draw dots and group them to divide an amount and clearly show a remainder. 	Complete written divisions and show the remainder using r. 29 ÷ 8 = 3 REMAINDER 5 ↑ ↑ ↑ ↑ dividend divisor quotient remainder	

Short division	Place value counters to group. 615 ÷ 5
	
	1. Make 615 with place value counters.
	2. How many groups of 5 hundreds can you make with 6 hundred counters?
	3. Exchange 1 hundred for 10 tens.
	4. How many groups of 5 tens can you make with 11 ten counters?
	5. Exchange 1 ten for 10 ones.
	6. How many groups of 5 ones can you make with 15 ones?
			98 ÷ 7 be 432 ÷ 5 becomes
			
			     1 8 6 r 2
			7
				9 5	4 3 ²2
					Answe Answer: 86 remainder 2
					
					496 ÷ 11 becomes
					         4 5 r 1
					1 1
						4 9 ⁵6
						Answer: $45\frac{1}{11}$	

Long Division	Use place value counters $2544 \div 12$		

Use place value counters
$2544 \div 12$

1000s	100s	10s	1s

We can't group 2 thousands into groups of 12 so will exchange them.

1000s	100s	10s	1s
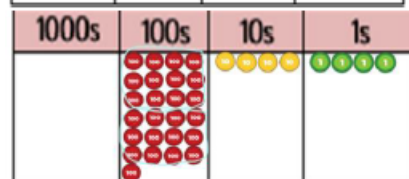
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

```
   0 2
12 2544
   24
    1
```

1000s	100s	10s	1s
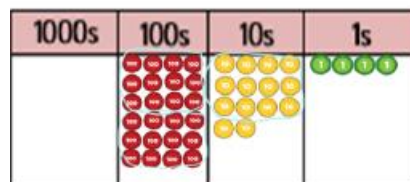
After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

```
   0 2 1
12 2544
   24
   14
   12
    2
```

1000s	100s	10s	1s
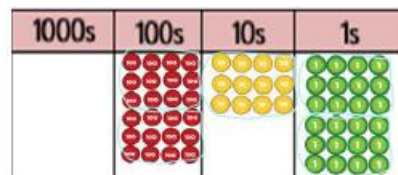
After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

```
   0 2 1 2
12 2544
   24
   14
   12
   24
   24
    0
```

$432 \div 15$ becomes

```
          2  8  r 12
   1  5 | 4  3  2
          3  0  0
          1  3  2
          1  2  0
             1  2
```

Answer: 28 remainder 12

$432 \div 15$ becomes

```
          2  8
   1  5 | 4  3  2
          3  0  0    15×20
          1  3  2
          1  2  0    15×8
             1  2
```

$\frac{12}{15} = \frac{4}{5}$

Answer: $28 \frac{4}{5}$

$432 \div 15$ becomes

```
          2  8 . 8
   1  5 | 4  3  2 . 0
          3  0
          1  3  2
          1  2  0
             1  2  0
             1  2  0
                   0
```

Answer: 28·8

Division of Fractions	$\frac{1}{2} \div 3 =$	$\frac{1}{2} \div 3 =$	$\frac{1}{2} \div 3 =$	
			$\frac{1}{2} \div \frac{3}{1} =$	
	Half of the pizza divided into three equal parts.	Half of the bar divided into three equal parts.	$\frac{1}{2} \times \frac{1}{3} = \frac{1}{6}$	

Progression in Times Tables

| **Concrete** - Children will be taught the concept of multiplication using practical resources.	**Pictorial** - Children will progress on to using number lines or pictures.	**Abstract 1** - Children will count in multiple steps.	**Abstract 2** - Children will recite times tables by rote. Links will be made with 'grouping' and division whilst times tables are being taught

Count in multiples supported by concrete objects in equal groups.

Use real-life arrays or build arrays.
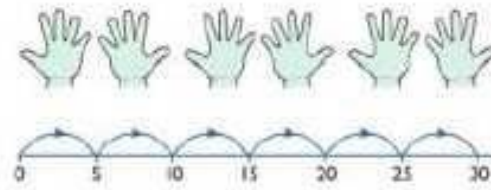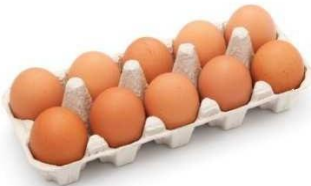
Use a number line or pictures to continue support in counting in multiples

$3 \times 2 = 6$
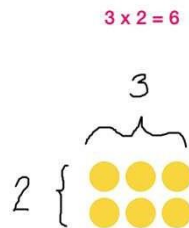
Count in multiples of a number aloud. Use a counting stick.

Write sequences with multiples of numbers.

2, 4, 6, 8, 10

5, 10 15, 20, 25, 30

$1 \times 7 = 7$	$7 \div 7 = 1$
$2 \times 7 = 14$	$14 \div 7 = 2$
$3 \times 7 = 21$	$21 \div 7 = 3$
$4 \times 7 = 28$	$28 \div 7 = 4$
$5 \times 7 = 35$	$35 \div 7 = 5$
$6 \times 7 = 42$	$42 \div 7 = 6$
$7 \times 7 = 49$	$49 \div 7 = 7$
$8 \times 7 = 56$	$56 \div 7 = 8$
$9 \times 7 = 63$	$63 \div 7 = 9$
$10 \times 7 = 70$	$70 \div 7 = 10$
$11 \times 7 = 77$	$77 \div 7 = 11$
$12 \times 7 = 84$	$84 \div 7 = 12$

Record multiplication number sentences. Link multiplication and division facts.

Recite times tables by rote orally.

3 times 3 equals 9 so 9 divided by 3 equals 3.
One third of 9 equals 3.
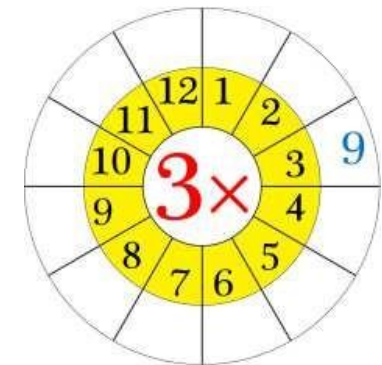
If you know 3 times 3 equals 9, what else do you know?

3 x 30 = 90 etc.