



How to make your child a KS1 Maths star!

A parents' guide to helping your child with Maths at home

Reception & Key Stage 1 - Y1 to Y2



The purpose of this booklet is to outline the various calculation methods that children are taught as they progress through the school, many of which look different to the methods that you may have been taught in your primary school days.

During Numeracy lessons children will be doing a mixture of counting, talking about numbers, mental calculations and using numbers to solve real life problems. They will begin to record what they've done with pictures and numbers. These recordings will help them to understand what is happening and to show how they've worked something out.

As they progress through the school, pupils build up a bank of strategies, from early mental calculation skills to formal written recordings that can be applied when appropriate.

This booklet shows the range of different methods that we are now teaching. We hope the explanations and examples of strategies will help you to assist your child at home.

Also included in the booklet are various ideas and suggestions for maths activities that you can enjoy doing with your child in the world away from school. It is not an exhaustive list and you will doubtless have many more ideas of your own.

Mental Calculations

The ability to calculate mentally lies at the heart of the National Curriculum. Mental calculation methods will therefore be taught systematically from Reception onwards and pupils will be given regular opportunities to develop the necessary skills.

Children are introduced to the processes of calculations through practical, oral and mental activities. Through these activities, they consolidate their understanding of number facts and begin to develop ways of recording to support their thinking and calculation methods.

As children progress through the school and are taught more formal written methods, they are still encouraged to think about mental strategies they could use first and only use written methods for those calculations they cannot solve in their heads.

When faced with a calculation problem, encourage your child to ask:

- Can I do this in my head?
- Could I do this in my head using drawings or jottings to help me?
- Do I need to use a written method?

Also help your child to estimate and then check the answer. Encourage them to ask:

- Is the answer sensible?

What mathematical facts will my child be taught?

Reception

- Count forwards and backwards in 1s to and from 20
- Place numbers up to 20 in order.
- Find one more or one less than a number from 1 to 20
- Number bonds and related subtraction facts within 10. E.g. $3 + 7$, or what to add to a single-digit number to make 10, e.g. $3 + * = 10$
- Add and subtract two single-digit numbers and count on or back to find the answer. E.g. $2 + 3$, $6 - 2$
- Addition doubles for numbers up to 10 E.g. double 4.
- Halving numbers: (10, 8) 6, 4, 2 or share into equal groups.
- Combine groups of 2 (5 or 10). Use words such as more, less, greater, smaller, heavier, lighter to compare things.
- Make simple patterns and talk about them.
- Name shapes such as a circle, square, triangle, rectangle, cube, cone and sphere.
- Use words such as over, under, above, below, on, in, next to, beside to describe where things are.



Helping your child learn in the EYFS

Useful Numeracy Websites:

- www.mathszone.co.uk
- www.bbc.co.uk/bitesize/ks1/maths
- www.familylearning.org.uk
- www.crickweb.co.uk/Early-Years.html
- www.crickweb.co.uk/ks1numeracy.html
- www.woodlands-junior.kent.sch.uk/maths/
- www.bbc.co.uk/schools/websites/4_11/site/numeracy.shtml
- www.amblesideprimary.com/ambleweb/numeracy.htm
- www.topmarks.co.uk

Recognising Numbers

- Choose a number for the week, e.g. 2. Encourage your child to look out for this number all the time. Can your child see the number 2 anywhere? At home - in the kitchen; On pages in a book; In the street - on doors, on car number plates; While out shopping - on the shop till, on shelves, in shop windows
- Find two apples, toys, spoons etc. Make patterns, such as two knives, two forks, two spoons, two knives, two forks, two spoons... Practise writing the number 2. Choose a different number each week.
- Dice game - Use a 'dotted' dice and write the numbers 1 to 6 on a sheet of paper (or use the numbered animals). Throw the dice. Can your child guess how many dots there are? Check by counting. Ask your child which number on the paper matches the dots on the dice.
- Stick numbers on the fridge - can you find number 8? 12? 17?
- Practise writing numbers on paper, in sand, with paint, in shaving foam etc.
- Hide numbers around the house and challenge them to find them then put them in order.

Counting ideas and putting numbers in order

- Practise chanting the number names. Encourage your child to join in with you. When they are confident, try starting from different numbers – e.g. 4,5,6 Also try counting backwards.
- Give your child the opportunity to count objects (coins, pasta, shapes, buttons etc.) Encourage them to move each object as they count them.
- Count things you cannot touch – window panes, jumps, claps, oranges in a bag.
- Make mistakes when chanting, counting or ordering numbers. Can your child spot the mistake?
- Choose a 'number of the week' e.g. 5. Practice counting in 5's, up to 5, on from 5, collect groups of 5 items.
- Cut out pictures of animals, or anything else your child is interested in. Label the animals 1 to 5. Shuffle the animals. Put them in order from 1 to 5 (or 1-10 or 1-20 etc.) Remove one animal. Ask your child which number is missing. Repeat with other numbers and more than one missing number. Ask your child to say what number comes before or after a number you choose; which number comes 2 before, 3 after etc.
- One more, one less. For this game you need a dice, a coin and some building blocks or Lego bricks. Take turns to roll the dice. Build a tower with that number of blocks or bricks. Then toss the coin. Heads means take one brick off. Tails means add one on. If you can guess how many bricks there will be after this, you keep them. The first to collect 20 bricks or more wins.

In the street

- Recognising bus numbers; comparing door numbers.
- Number plate hunt. Who can find a 7? Add the numbers up.

Doing the washing

- Counting in 2s – matching shoes; pairing up socks.
- Sorting by colour and size.
- Find four shoes that are different sizes. Can you put them in order?

Time

- What day is it yesterday, today, tomorrow?
- Use timers, phones and clocks to measure short periods of time e.g. time two minutes for brushing teeth.
- Count down 10/ 20 seconds to get to the table/ into bed etc.
- Recognising numbers on the clock. If you cover a number, what number was missing?

Food

- Can you cut your toast into 4 pieces? Can you cut it into triangles?
- Setting the table. Counting the right number of plates etc. How many more do we need?
- Can you make shapes/ patterns out of the knives and forks?
- Helping with the cooking by measuring and counting ingredients.

Going shopping

- Reading price tags.
- Counting items into the basket.
- Finding and counting coins.
- Comparing weights – which is heavier?

Measuring

- Are you taller than a ...?
- Marking height on the wall.
- Cut hand shapes out of paper. How many hands long is the sofa? How long is the table? Who has the biggest hands in our family?
- How many steps from the gate to the front door?
- Let the children pour from one container to another so that they can understand that the volume of liquid does not change, unless some is added or taken away, even though it may change its shape.

Games

- Putting cards into piles
- Jigsaws
- Snakes and ladders or other simple dice games
- Adding numbers on two dice
- Bingo

Year 1

- Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number.
- Count, read and write numbers to 100 in numerals.
- Read and write numbers from 1 to 20 in numerals and words.
- Say the number that is 1 more or less than a given number, and 10 more or less for multiples of 10
- Derive and recall all pairs of numbers with a total of 10 and addition facts for totals to at least 5; work out the corresponding subtraction facts.
- Derive number bonds and related subtraction facts within 20. E.g. $9 + 7 = 16$; $16 - 7 = 9$; $7 = 16 - 9$, or what to add to a single-digit number to make 20, e.g. $13 + * = 20$.
- Add and subtract one-digit and two-digit numbers to 20. E.g. $13 + 5$; $17 - 9$
- Count on or back in ones, twos, fives and tens and use this knowledge to derive the multiples of 2, 5 and 10 to the tenth multiple
- Addition doubles for all numbers to at least 10 E.g. $8 + 8$, double 6.
- Recognise odd and even numbers up to 20.
- Put numbers in order and use terms like greater/smaller than and $=$.
- Use the words add, sum, total, take away, subtract, difference between...
- Record information lists and tables and use practical resources, pictures, block graphs or pictograms to present outcomes.
- Compare objects or containers, and say which is longer/shorter, or heavier/lighter, holds more etc.
- Name 2-D and 3-D shapes and describe their features; use them to make patterns models or pictures.

Year 2

- Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward.
- Read and write numbers to at least 100 in numerals and in words.
- Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.
- Recall and use addition and subtraction facts to at least 20 fluently e.g. $9 + 8$, $17 - 9$, and derive and use related facts up to 100.
- Number Bonds to 100 - pairs of multiples of 10 with totals up to 100, e.g. $30 + 70$
- Sums and differences of multiples of 10, e.g. $50 + 80$, $120 - 90$ and number pairs that total 100
- Add and subtract numbers including: a two-digit number and ones; a two-digit number and tens; - two two-digit numbers
- What must be added to any two-digit number to make the next multiple of 10?
- Addition doubles for all numbers to 20, e.g. $17 + 17$ and multiples of 10 to 50, e.g. $40 + 40$
- Understand that halving is the inverse of doubling and derive and recall doubles of all numbers to 20, and the corresponding halves.
- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables and corresponding division facts/Recognise multiples of 2, 5 and 10
- Doubles of all numbers to 20. E.g. double 13, and corresponding halves.
- Doubles of multiples of 10 to 50. E.g. double 40, and corresponding halves.
- Odd and even numbers to 100.
- Understand opposite (inverse) relations E.g. $4 \times 5 = 20$ and $20 \div 5 = 4$.
- Find $\frac{1}{2}$, $\frac{1}{4}$ and $\frac{3}{4}$ of shapes and sets of objects.
- Use lists, tables, and diagrams; represent data as block graphs or pictograms.
- Measure or weigh using metres, centimetres, kilograms or litres.
- Use a ruler to draw and measure lines to the nearest centimetre.
- Use symbols $+$, $-$, \times , \div and $=$, to record work with number sentences.
- Tell the time to the half and quarter hour; know seconds, minutes, hours and days and how they relate to one another
- Name 2-D and 3-D shapes and describe their features; sort make and describe shapes referring to their properties.
- Solve number problems (including pounds, pence, measures etc), and explain how to work them out.

Helping your child learn at home in Key Stage 1

Counting and Place Value - Counting forms an important part of the calculation children have to do every day. With good counting skills, children can add, subtract, multiply and divide.

- Counting on or back in 1s, 10s and 100s from any number
- Going Up and Down Your Stairs - Pick a number for the bottom step. Then count in tens or hundreds going up. Counting in hundreds can be done in grams and millimetres as well. Pick a bigger number for the top step and count backwards as you go down the stairs. (For some, this can be done using decimals or even move into negative numbers).
- Counting in regular steps going up or down stairs can help with times tables. What number will we be on when we reach the 6th step? What number is at the top/bottom step? How many steps to reach 28 if we count in 4s? If we count in 200g steps, when will we reach 1kg?
- Car Journeys - Choose the colour of a car. Each time you see a car of your colour, look at the number plate. The person who has seen the largest/smallest number on a number plate is the winner. What is the number on the plate? What is this to the nearest 10 or 100 or 1000? How many more would you need to reach the next multiple of 10, 100 or 1000?
- Disco numbers - Hundreds = Touch your head; Tens = Touch your shoulders; Ones/units = Clap your hands/stamp your feet. So, for 326...Touch your head 3 times, touch your shoulders twice and clap/stamp 6 times.
- Secret numbers - Write the numbers 0 to 20 on a sheet of paper. Ask your child secretly to choose a number on the paper. Then ask him / her some questions to find out what the secret number is, e.g. Is it less than 10? Is it between 10 and 20? Does it have a 5 in it?
He / she may answer only yes or no. Once you have guessed the number, it is your turn to choose a number. Your child asks the questions. For an easier game, use numbers up to 10. For a harder game, use only 5 questions, or use bigger numbers.
- Dice game - You need a 1–6 dice, paper and pencil. Take turns. Choose a number between 1 and 10 and write it down. Throw the dice and say the dice number. Work out the difference between the chosen number and the dice number, e.g. if you wrote down a 2 and the dice shows 5, the difference is 3. You could also draw a number line to help your child to see the difference between the two numbers.
- How old? Start with your child's age. Ask your child: How old will you be when you are 1 year older? How old were you last year? How old will you be 10 years from now? and so on.
- Look outside for 'thirties' numbers, such as 34 or 38, on house doors, number plates, bus stops, etc. How many can you spot? What is the biggest one you can find? Look for 'fifties' numbers or 'sixties'... etc.

Practicing Number Facts

- Its important children learn number bonds to 10 e.g. $4 + 6 = 10$; $3 + 7 = 10$ and number bonds to 20 e.g. $14 + 6 = 20$; $12 + 8 = 20$ by heart.
- Play 'ping pong' to practice components with your child. You say a number and they reply with how much more is needed to make 10, 20, 100 or 1000. Encourage your child to answer quickly without counting or using fingers. E.g. make 100 you shout 40 they shout 60.
- Throw two dice. Ask your child to find the total of the numbers (+), the difference between them (-) or the product (x).
- Use a set of playing cards (without the picture cards). Turn over two cards and ask your child to add or multiply the numbers. If they answer correctly, they keep the cards. How many cards can they collect in two minutes?
- Play Bingo. Each player chooses five answers (e.g. numbers to 10 to practice simple addition, multiples of 5 to practice the five times table etc). Ask a question and if a player has the answer, they can cross it off. The winner is the first player to cross off all their answers.
- Give your child an answer. Ask them to write as many number sentences as they can with this answer. You could just ask for addition sentences or any type of calculation.



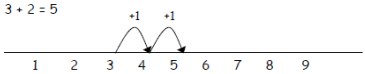
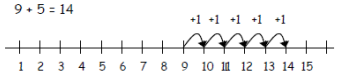


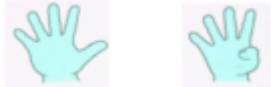
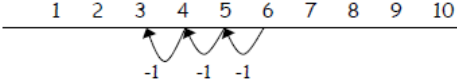









- Give your child a number fact – e.g. $5 + 8 = 13$. Ask them what else they can find out from this fact – $50 + 80 = 130$, $8 + 5 = 13$, $13 - 8 = 5$, $130 - 50 = 80$ etc.
- Make up rhymes together to help your child remember tricky times tables.
- Rehearse times tables by counting in 'steps' of 2, 5 and 10 etc. Count using silly voices e.g. robot.
- Adding circles - For this game, you need a dice and pencil and paper. Each of you should draw four circles on your piece of paper. Write a different number between 2 and 12 in each circle. Roll the dice twice. Add the two numbers. If the total is one of the numbers in your circles then you may cross it out. The first person to cross out all four circles wins.
- Dicey coins - For this game you need a dice and about twenty 10p coins. Take turns to roll the dice and take that number of 10p coins. Guess how much money this is. Then count aloud in tens to check, e.g. saying ten, twenty, thirty ... If you do this correctly you keep one of the 10p pieces. First person to collect £1 wins.
- Speedy pairs to 10 - Make a set of 12 cards showing the numbers 0 to 10, but with two 5s. If you wish, you could use playing cards. Shuffle the cards and give them to your child. Time how long it takes to find all the pairs to 10. Repeat later in the week. See if your child can beat his / her time.
- Circle trios - Draw four circles each on your piece of paper. Write four numbers between 3 and 18, one in each circle. Take turns to roll a dice three times and add the three numbers. If the total is one of the numbers in your circles then you may cross it out. The first to cross out all four circles wins.

Shape & Measure

- Choose a shape of the week e.g. a square. Look for this shape in the environment. How many of these shapes can your child spot during the week, at home and when you are out?
- At home, or when you are out, look at the surface of shapes. Ask your child – what shape is this plate, this mirror, the bath mat, the tea towel, the window, the door, the red traffic light, and so on.
- Play 'guess my shape'. You think of shape. Your child asks questions to try to identify it but you can only answer 'yes' or 'no'.
- Hunt for right angles around your home.
- Look for symmetrical objects. Help your child to paint or draw symmetrical pictures/patterns.
- Make a model using different boxes/containers of different sizes.
- Practise measuring the lengths and heights of objects in metric measurements. Help your child use different rulers or tape measures correctly. Encourage them to estimate before measuring. Compare measurements in metric and imperial.
- Let your child help with the cooking. Help them to measure ingredients accurately. Talk about what each division on a scale represents.
- Choose some food items out of the cupboard. Try to put the objects in order of weight by feel alone. Then check by looking at the weights on the packets.
- Practise telling the time with your child. Use both digital and analogue clocks. Ask your child to be a 'timekeeper' – e.g. tell me when it is half past four because we are going swimming.
- Use a stop clock to time how long it takes to do everyday tasks –e.g. how long does it take to get dressed. Encourage your child to estimate first.
- Use a TV guide. Ask your child to work out the length of their favourite programmes. Can they calculate how long they spend watching TV each day/week?
- Using Recipes - Recipes often suggest how many people you can feed or how many items you can make. If the recipe is for 8 people, can you make it for 4? If the recipe is for 8 biscuits, have we got enough ingredients to make 16? Will there be any biscuits/cakes left for you to give to your teacher?

Real Life Problems

- Go shopping with your child to buy two or three items. Ask them to work out the total amount spent and how much change you will get. Shopping also gives children the opportunity to spot and name shapes, especially 3-D shapes (e.g. cubes, cylinders, cuboids, spheres, prisms, cones, pyramids etc.).

HOW ARE THESE METHODS TAUGHT? Calculation Guidelines for Foundation Stage (Reception Class)			
ADDITION	SUBTRACTION	MULTIPLICATION	DIVISION
Children begin to record in the context of play or practical activities and problems.			
<p>Pupils count sets of objects. Use of games, songs and practical activities to begin using vocabulary.</p> <p>They then develop ways of recording calculations using dots, pictures, words or symbols of addition activities carried out.</p> <p>Pictures / Objects - I buy 2 cakes and my friend buys 3 cakes. How many cakes did we buy altogether? (3 + 2)</p>  <p>Symbols - 8 people are on the bus. 5 more get on at the next stop. How many people are on the bus now? (8+5)</p>  <p>Bead strings or bead bars are used in school to illustrate addition.</p> <p>They start to use number tracks, to count on. Teachers demonstrate the use of the number track.</p>  <p>Children then begin to use numbered lines independently to count on in ones.</p>  <p>Children use their fingers for counting to 10. Solve simple word problems using their fingers</p>  <p>Can find one more to ten.</p>	<p>Relate subtraction to taking away and counting how many objects are left.</p> <p>Make a record in pictures, words or symbols of subtraction activities already carried out.</p> <p>I have five cakes. I eat two of them. How many do I have left?</p>  <p>Use of games, songs and practical activities to begin using vocabulary e.g. 10 green bottles,</p> <p>Construct number sentences to go with practical activities</p>  <p>Can find one less to ten.</p> <p>They use number track, their fingers and practical resources to support calculation. Teachers demonstrate the use of the number track.</p> <p>Counting backwards along a number line using finger.</p> 	<p>Real life contexts and use of pictures, symbols and practical equipment to count in repeated groups of the same size (1s / 2s / 5s / 10s)</p> <p>E.g. Counting/chanting in 2s</p>  <p>Pictures / Objects...</p> <p>3 plates, 2 cakes on each plate:</p>  <p>Symbols</p>  <p>3 plates, 2 cakes on each plate:</p> <p>E.g. Count/chant in tens.</p>  <p>Double numbers up to 5. E.g. Double 1, double 2, double 3 etc.</p>	<p>Share objects into equal groups.</p> <p>Pictures / Objects</p>  <p>6 cakes shared between 2</p>  <p>6 cakes put into groups of 2</p>  <p>Symbols</p> <p>6 cakes shared between 2</p>  <p>6 cakes put into groups of 2</p>  <p>Use related vocabulary:</p> <p>How many times? How many are left/left over? Group Answer Right, wrong What could we try next? How did you work it out? Share out Half, halve</p>

HOW ARE THESE METHODS TAUGHT?

ADDITION GUIDELINES

Year One

Revise adding two sets of numbers by drawing pictures, dots or tally marks.

E.g. At a party, I eat 3 cakes and my friend eats 6. How many cakes did we eat altogether? ● ● ● ● ● ● ●

+ = signs and missing numbers

Children need to understand the concept of equality before using the '=' sign. Calculations should be written either side of the equality sign so that the sign is not just interpreted as 'the answer'.

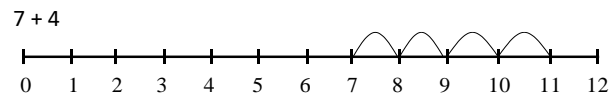
$$2 = 1 + 1 \quad 2 + 3 = 4 + 1 \quad 3 = 3 \quad 2 + 2 + 2 = 4 + 2$$

Missing numbers need to be placed in all possible places.

$$\begin{array}{llll} 3 + 4 = \square & \square = 3 + 4 & 3 + \square = 7 & 7 = \square + 4 \\ \square + 4 = 7 & 7 = 3 + \square & \square + \nabla = 7 & 7 = \square + \nabla \end{array}$$

The Number Line

Children use a numbered line to count on in ones.



Recording by:
- drawing jumps on prepared lines
- constructing own lines

Extend to word problems using a number line. E.g. 7 people are on the bus. 4 more get on at the next stop. How many are on the bus now. (See above)

Extend to adding one-digit and two-digit numbers to 20 using the number line. E.g. 12 + 5 (start counting on from 12 on the number line, and move 5 places/jumps to land on 17).

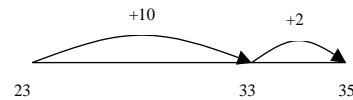
Year Two

+ = signs and missing numbers

Continue using a range of equations as in Y1 but with appropriate, larger numbers. E.g. Extend to $14 + 5 = 10 + \square$ and $32 + \square + \square = 100$
 $35 = 1 + \square + 5$

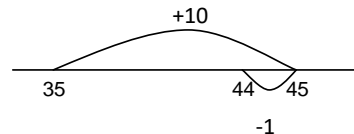
Count on using a number line in tens and ones (rather than jump in ones along the whole line, jump on a whole ten, then jump in ones).

E.g. $23 + 12 =$ 23 jump on 10/+ 10 = 33 then jump on 2/+ 2 = 35



Add 9 or 11 by adding 10 and adjusting by 1

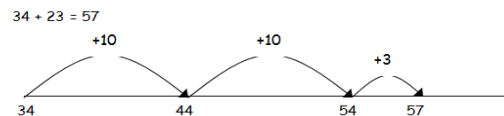
$$35 + 9 = 44$$



Calculations methods for more able pupils can be extended to:

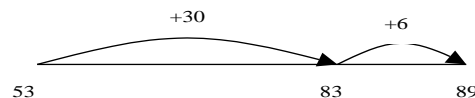
Partition into tens and ones for larger numbers

Partition both numbers and recombine.



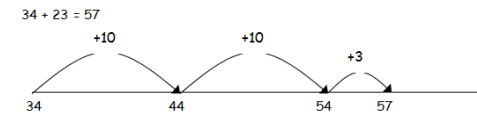
Count on by partitioning the second number only e.g.

$$\begin{aligned} 36 + 53 &= 53 + 30 + 6 \\ &= 83 + 6 \\ &= 89 \end{aligned}$$



Year Three

Partition into tens and ones -Partition both numbers and recombine.
(In the example below, 23 is split into 10, 10 and 3).

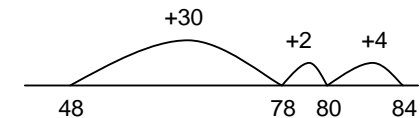


Count on by partitioning the second number only e.g.

$$36 + 53 = 53 + 30 + 6 = 83 + 6 = 89$$



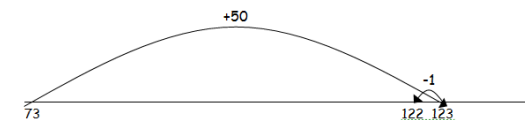
48 + 36 = 84



Count on from the largest number irrespective of the order of the calculation e.g. 38 + 86 = 124



Compensation e.g. $49 + 73 = 122$



Add a near multiple of 10 to a two-digit number

Partition into tens and ones and recombine using informal jottings rather than a number line

Partition means to break the tens and units digit up into 2 separate numbers. E.g. 12 can be broken up into 10 + 2 (12); 23 can be broken up into 20 + 3 (23)

E.g. $12 + 23$

Group the tens numbers and add them = $10 + 20$ (30)

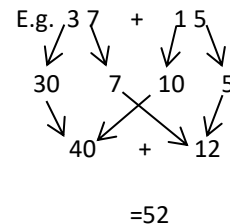
Group the units numbers and add them = $2 + 3$ (5)

Add both sets of numbers together = $30 + 5$

Get the answer = 35

E.g. $16 + 35 = 10 + 30 = 40$; $6 + 5 = 11 = 40 + 11 = 51$

Partition into tens and units using the diamond method



Secure mental methods by using a number line to model the method. Continue as in Year 2 but with appropriate numbers e.g. $35 + 19$ is the same as $35 + 20 - 1$.

Pencil and paper procedures (partitioning = break the number up into its tens and units)

$$67 + 24 = 80 (60 + 20) + 11 (7 + 4) = 91$$

$$267 + 85 = 200 + 140 (60 + 80) + 12 (7 + 5) = 352$$

Add numbers with up to 3 digits, using formal written methods.

625	783
+ 48	+ 142
<u>673</u>	<u>925</u>
1	1

Using similar methods, children will:

- add several numbers with different numbers of digits;
- begin to add two or more three-digit sums of money, with or without adjustment from the pence to the pounds;
- know that the decimal points should line up under each other, particularly when adding or subtracting mixed amounts, e.g. $\text{£}3.59 + 78\text{p}$.
- solve word problems. E.g My sunflower is 123cm tall in May. By June it has grown another 56cm. How tall is the sunflower now?

HOW ARE THESE METHODS TAUGHT? SUBTRACTION GUIDELINES

Year One

- = signs and missing numbers

$$\begin{array}{llll} 7 - 3 = \square & \square = 7 - 3 & 7 - \square = 4 & 4 = \square - 3 \\ \square - 3 = 4 & 4 = 7 - \square & \square - \nabla = 4 & 4 = \square - \nabla \end{array}$$

Understand subtraction as 'take away'

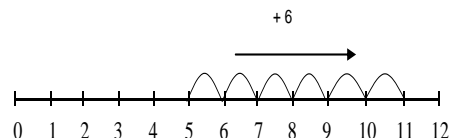
E.g. 5-2. I had five balloons. Two burst. How many did I have left?



take away = 3 left

Understand how to 'find the difference' by counting on/up ...

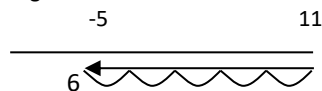
I have saved 5p. The socks that I want to buy cost 11p. How much more do I need in order to buy the socks?



E.g. A teddy bear costs £5 and a doll costs £2. How much more does the bear cost? (Count on/up from the £2 to £5)

Find a 'difference' by counting back

I have 11 toy cars. There are 5 cars too many to fit in the garage. How many cars fit in the garage?



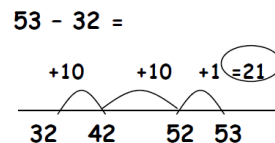
Extend to subtracting one-digit and two-digit numbers to 20 using the number line. E.g. 13 - 6; 19 - 8; 17-11; 19-14 etc.

Year Two

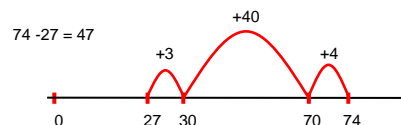
- = signs and missing numbers - Continue using a range of equations as in Year 1 but with appropriate numbers. Extend to $14 + 5 = 20 - \square$

Find a small difference by counting on in units. E.g. $42 - 39 = 3$

Find a difference by 'counting on' using a number line

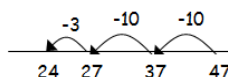


Also jumps can be in 10s and/or 1s



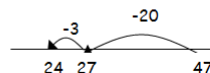
Find a difference by 'taking away' - counting back method

$$47 - 23 = 24$$



Subtracting the tens in one jump and the units in one jump.

$$47 - 23 = 24$$



Counting back method

Year Three

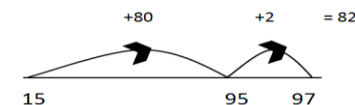
Find a small difference by counting up - Continue as in Y2 but with appropriate numbers e.g. $102 - 97 = 5$ (count on from 97 up to 102)

Subtract mentally a 'near multiple of 10' to or from a two-digit number - Continue as in Year 2 but with appropriate numbers e.g. $78 - 49$ is the same as $78 - 50 + 1$

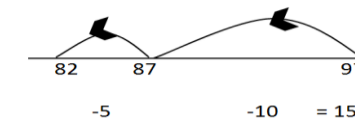
Use known number facts and place value to subtract

Continue as in Y2 but with appropriate numbers e.g. $97 - 15 = 82$ $97 - 82 = 15$ (count on from the lower number up to the larger number OR back from the larger number to the smaller).

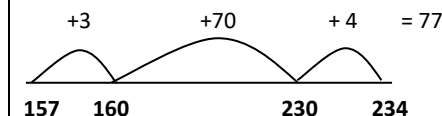
Counting on method



Counting back



Finding the difference or 'counting on using the number line' for 3 digit number e.g. $234 - 157$



Subtract numbers with up to 3 digits, using formal written/column methods.

$$\begin{array}{r} 567 \\ - 341 \\ \hline 226 \end{array}$$

$$\begin{array}{r} 614 \\ - 74 \\ \hline 540 \\ - 286 \\ \hline 254 \end{array}$$

MULTIPLICATION GUIDELINES

Year One

Multiplication is related to doubling, counting groups of the same size and repeated 'addition'.

Looking at columns

$$2 + 2 + 2$$

3 groups of 2

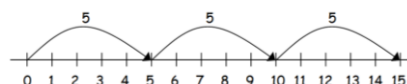
Looking at rows

$$3 + 3$$

2 groups of 3



$$5 \times 3 = 5 + 5 + 5$$



Counting using a variety of practical resources

Counting in 2s e.g. counting socks, shoes, animal's legs...

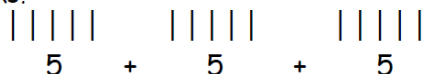
Counting in 5s e.g. counting fingers, fingers in gloves, toes...

Counting in 10s e.g. fingers, toes...

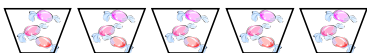
Pictures / marks

$$5 \times 3 =$$

There are 5 cakes in a pack. How many cakes in 3 packs?



There are 3 sweets in a bag. How many sweets are there in 5 bags?



Introduce arrays and repeated addition

$$4 \times 2 \text{ or } 4 + 4$$

$$2 \times 4 \text{ or } 2 + 2 + 2 + 2$$

Year Two

x = signs and missing numbers

$$7 \times 2 = \square$$

$$\square = 2 \times 7$$

$$7 \times \square = 14$$

$$14 = \square \times 7$$

$$\square \times 2 = 14$$

$$14 = 2 \times \square$$

$$\square \times \nabla = 14$$

$$14 = \square \times \nabla$$

Arrays

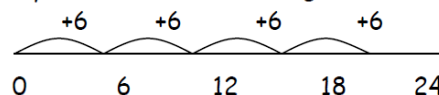
$$4 \times 2 \text{ or } 4 + 4$$

$$2 \times 4 \text{ or } 2 + 2 + 2 + 2$$

Repeated addition

$$6 \times 4 =$$

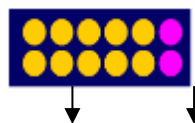
There are 4 cats. Each cat has 6 kittens. How many kittens are there altogether?



Doubling multiples of 5 up to 50 using partitioning

$$15 \times 2 = 30$$

Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: $6 = 5 + 1$ so e.g. Double 6 is the same as double five add double one.



AND double 15

$$10 + 5$$

$$20 + 10 = 30$$

OR

$$\begin{array}{r|rr} \times & 10 & 5 \\ \hline 2 & 20 & 10 \\ \hline & 30 & \end{array}$$

Year Three

x = signs and missing numbers and arrays and repeated addition - as in Year 2 but with appropriate numbers.

Use known facts and place value to carry out multiplications using the grid method

There are 13 biscuits in a packet. How many biscuits in 7 packets?

X	10	3	
7	70	21	91

To calculate 13×7 using the grid method, the numbers are partitioned into parts (10's and 1's) and each of these is multiplied by 7. The two answers are then added together.

Partition $32 \times 3 = 96$

$$\begin{array}{r|rr} \times & 30 & 2 \\ \hline 3 & 90 & 6 \\ \hline & 96 & \end{array}$$

Using an informal jotting using partitioning

$$30 \times 5 = (30 \times 5) + (8 \times 5) = 150 + 40 = 190$$

Expanded Column Multiplication – Children should describe what they do by referring to the actual values of the digits in the columns. E.g. 38×7 is '30 multiplied by 7', not '3 times 7'.

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 56 \quad (8 \times 7 = 56) \\ 210 \quad (30 \times 7 = 210) \\ \hline 266 \quad (56 + 210 = 266) \end{array}$$

Short Column Multiplication

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ \hline 5 \end{array}$$

DIVISION GUIDELINES

Year One

Sharing - Requires secure counting skills. Develop importance of one-to-one correspondence.

Sharing – 6 sweets are shared between 2 people. How many do they have each?



Grouping - Sorting objects into 2s / 3s/ 4s etc. How many pairs of socks are there?



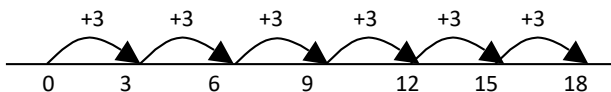
Grouping in 4s:

4 apples are packed in a basket. How many baskets can you fill with 12 apples?



Grouping in 3s: There are 12 crocus bulbs. Plant 3 in each pot. How many pots are there?

Grouping - How many 3's make 18? (Draw jumps of 3 along a number line. This shows that you need 6 jumps of 3 to reach 18).



We do not use repeated subtraction.

Year Two

÷ = signs and missing numbers

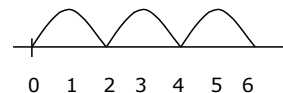
$$6 \div 2 = \square \quad \square = 6 \div 2 \quad 6 \div \square = 3 \quad 3 = 6 \div \square$$

$$\square \div 2 = 3 \quad 3 = \square \div 2 \quad \square \div \nabla = 3 \quad 3 = \square \div \nabla$$

Understand division as sharing and grouping

6 ÷ 2 can be modelled as: There are 6 strawberries. How many people can have 2 each? How many 2s make 6?

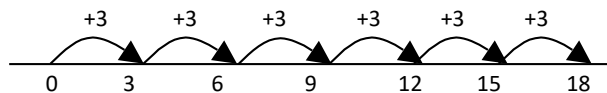
6 ÷ 2 can be modelled as:



18 ÷ 3 can be modelled as:

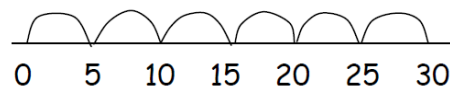
Sharing – 18 shared between 3 (see Year 1 diagram)

Grouping - How many 3's make 18?



30 ÷ 5 extended to a word problem ...

A chew bar costs 5p. How many can I buy with 30p?



Fractions - Link to counting, understanding number and simple fractions e.g. find $\frac{1}{2}$, $\frac{1}{4}$, $\frac{3}{4}$ of shapes and sets of objects. E.g. $\frac{1}{4}$ of 20 = $20 \div 4 = 5$

In the context of money count forwards and backwards using 2p, 5p and 10p coins

We do not use repeated subtraction.

Year Three

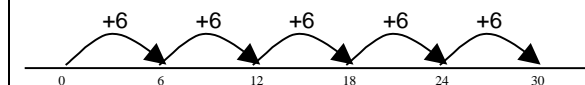
÷ = signs and missing numbers

$$26 \div 2 = \square \quad 24 \div \triangle = 12 \quad \square \div 10 = 8$$

Sharing and Grouping

30 ÷ 6 can be modelled as:

Grouping – groups of 6 placed on no. line and the number of groups counted e.g.



Sharing – sharing among 6, the number given to each person

Remainders:

16 ÷ 3 = 5 r1 How many 3's make 16, how many left over?



