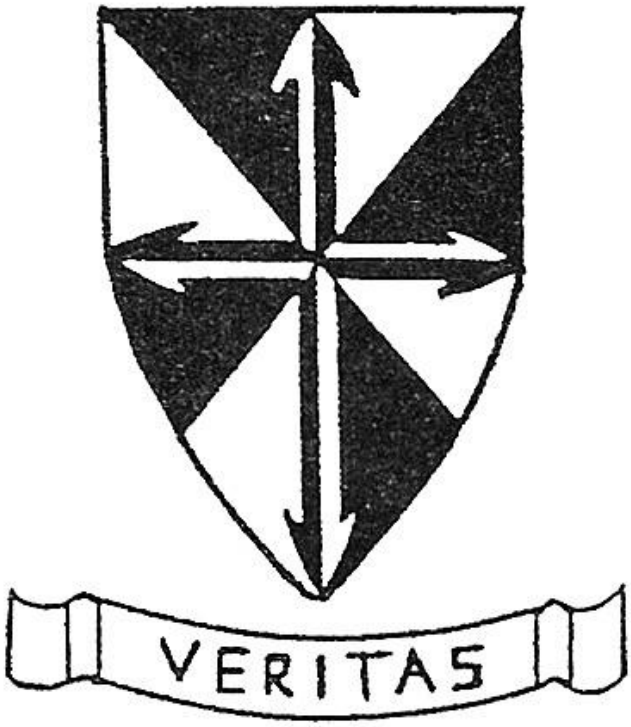
The Annunciation Catholic Junior School



The Annunciation Catholic Junior School Calculation Policy

KS2

The Annunciation Catholic Junior School Calculation Policy

This document is a statement of the aims, principles and strategies for the teaching and learning of mathematical calculations at The Annunciation Junior School.

Introduction

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)

Rationale

This policy outlines a model progression through written strategies for addition, subtraction, multiplication and division in line with the 2014 National Curriculum.

The written calculation section of the policy demonstrates the expected (Age Related Expectations) methods to be used in different year groups, when recording in a book.

School wide policies, such as this, ensure consistency of approach, enabling children to progress stage by stage through models and representations they recognise from previous teaching, allowing for deeper conceptual understanding and fluency. As children move at the pace appropriate to them, teachers will be presenting strategies and equipment appropriate to children's level of understanding (progression of skills). However, it is expected that the majority of children in each class will be working at age-appropriate levels as set out in the National Curriculum 2014 (Written calculation) and in line with school policy.

The aims of the 2014 National Curriculum are for our pupils to:

- Become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

The purpose of Mathematics in our school is to develop:

- positive attitudes towards the subject and awareness of the relevance of mathematics in the real world
- competence and confidence in using and applying mathematical vocabulary, knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately
- initiative and motivation to work both independently and in cooperation with others
- confident communication of maths where pupils ask and answer questions, openly share work and
- an ability to learn from mistakes
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and investigation

We aim to provide a stimulating and exciting learning environment that takes account of different learning styles and uses appropriate resources to maximise teaching & learning.

Breadth of study

Careful planning and preparation ensures that throughout the school children engage in:

- practical activities and games using a variety of resources
- problem solving to challenge thinking
- individual, paired, group and whole class learning and discussions
- purposeful practise where time is given to apply their learning
- open and closed tasks
- a range of methods of calculating e.g. mental, pencil & paper and using a calculator
- working with computers as a mathematical tool

Through our creative approach to teaching and learning we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas.

Teachers planning and organisation

Long term planning

The National Curriculum for Mathematics 2014 and White Rose Maths provide the long-term planning for mathematics taught in the school.

Medium term planning

Years 3-6 use the White Rose Maths Hub schemes of learning as their main medium term planning documents. We use other resources for extension work, investigations and 'hands on' lessons.

These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth.

They support pupils working together as a whole group and provide plenty of time to build reasoning and problem solving elements into the curriculum.

Short term planning
The above schemes of learning support daily lesson/notebook planning. Lessons are planned using a common planning format and are monitored weekly by the Mathematics Subject Leader.

All classes have a daily Mathematics lesson. Lessons last 60 minutes and all classes have 1 or 2 half hour arithmetic sessions. Daily Brain Trainers are sent home which focus solely on arithmetic to keep skills sharp.

Special educational needs & disabilities (SEND)
Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's IEP's incorporate suitable objectives from the National Curriculum for Mathematics and teachers keep these in mind when planning work.

These targets may be worked upon within the lesson as well as on a 1:1 basis outside the Mathematics lesson. Maths focused intervention in school helps children with gaps in their learning and mathematical understanding. These are delivered by trained support staff and overseen by the SENCO and/or the class teacher. We currently use Plus 1 and The Power of 2 as our interventions.

Within the daily mathematics lesson teachers have a responsibility to not only provide differentiated activities to support children with SEND but also activities that provide sufficient challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability. 2 Extension activities are provided for those who finish their work or need an extra challenge.

Equal Opportunities
Positive attitudes towards Mathematics are encouraged, so that all children, regardless of race, gender, ability or special needs, including those for whom English is a second language, develop an enjoyment and confidence with Mathematics.

The aim is to ensure that everyone makes progress and gains positively from lessons and to plan inclusive lessons. Lessons involving lots of visual, aural and kinaesthetic elements will benefit all children including those for whom English is an additional language (EAL).

Differentiated questions are used in lessons to help children and planned support from Teaching Assistants and other adults.

Lessons
In all lessons, learning objectives and key vocabulary are clearly displayed and discussed.

The emphasis in lessons is to make teaching interactive and lively, to engage all children, encouraging them to talk about Mathematics. Lessons involve elements of:

- Instruction – giving information and structuring it well;
- Demonstrating – showing, describing and modelling mathematics using appropriate resources and visual
- Displays;
- Explaining and illustrating – giving accurate and well-paced explanations;
- Questioning and discussing;
- Consolidating;
- Reflecting and evaluating responses – identifying mistakes and using them as positive teaching points;
- Summarising – reviewing mathematics that has been taught enabling children to focus on next steps

Pupils' Records of work

Children are taught a variety of methods for recording their work and are encouraged and helped to use the most effective. Children are encouraged to use mental strategies and their own jottings before resorting to more formal written methods. Children's own jottings to support their work is encouraged throughout all year groups.

Marking

Marking of children's work is essential to ensure they make further progress. Work is marked each session and includes verbal feedback; challenges; corrections and (if appropriate) teacher modelling. Children are encouraged to self-assess their work and given time to read teachers' comments and make corrections or improvements. Teachers also use the 3 tick strategy to assess against the Learning Question.

Responses to marking are made at the start of the next lesson. Some pieces of work in mathematics can be marked by children themselves (e.g. Flashbacks), exercises involving routine practice with support and guidance from the teacher.

Assessment

Assessment is an integral part of teaching and learning and is a continuous process.
Teachers make assessments of children daily through;

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- AfL questions are used in lessons

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short term planning evaluated in light of these assessments.

Medium term
Termly assessments are carried out across the school using the assessment materials for each year group provided by White Rose Maths. These materials used alongside judgements made from class work support teachers in making a steps assessment for each child.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

Long term
Y6 complete the national tests (SATs) in May.

Resources
Mathematical equipment and resources are stored centrally in the Maths cupboards.
TTRockstars
TTRockstars, a fully interactive online mathematics learning tool for children is used to support quick recall of times tables both in class and at home. Children are set homework battles on TTRockstars in line with the homework policy and are encouraged by school to access it regularly at home to support areas of mathematical learning.

Role of the Maths Subject Leader

- To lead in the development of Mathematics throughout the school.
- To monitor the planning, teaching and learning of Mathematics throughout the school.
- To help raise standards in Mathematics.
- To provide teachers with support in the teaching of Mathematics.
- To provide staff with CPD opportunities in relation to Mathematics within the confines of the budget and the School Improvement Plan.
- To monitor and maintain high quality resources.
- To keep up to date with new developments in the area of Mathematics.

The importance of mental mathematics
While this policy focuses on written calculations in mathematics and the use of physical resources to support learning a topic, we recognise the importance of the mental strategies and known facts that form the basis of all calculations. Children recite times tables everyday and have Keeping Skills Sharp bursts which involve quick mental recall

This policy will be reviewed Autumn 2022.
Staff responsible
Mrs. C Minihan – Executive Head Teacher
Mrs. R Pearce - Maths Leader

Content

Written calculation

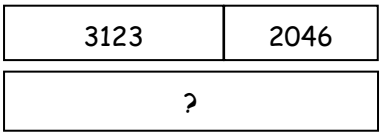
Written calculations

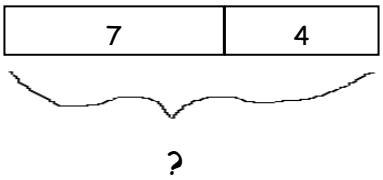
Addition

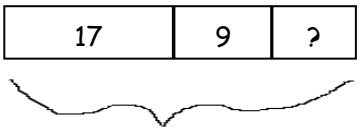
Addition names the whole in terms of the parts and **subtraction** names a missing part of the whole.

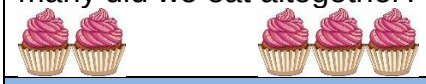
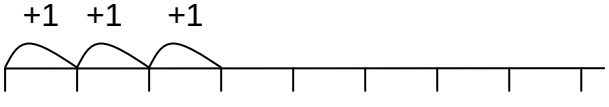
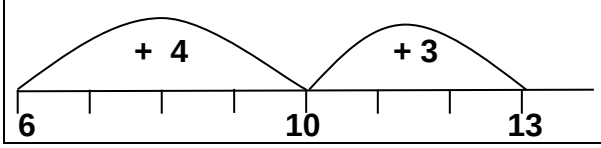
Bar modelling

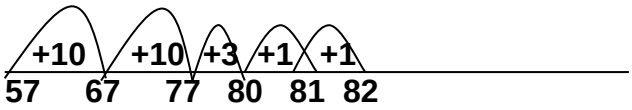
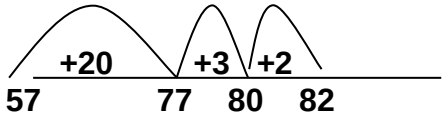
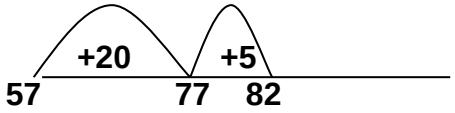
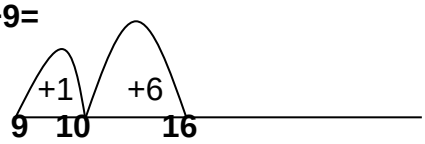
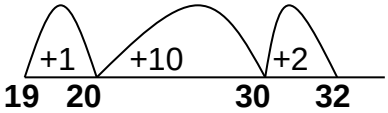
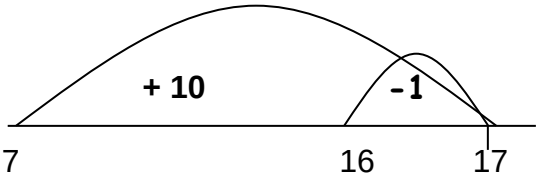
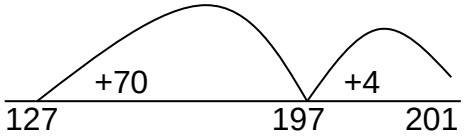
Bar modelling is a method used at all ages. Its focus is on **understanding the worded question**, **not answering it**. It is used to add two or more numbers and can be presented in a variety of ways beginning with physical blocks and then moving onto drawn bars. Children add information from the text, one sentence at a time. Below are a few examples:







Calculation Method	Explanation
EYFS	
Counting Children record the total number of items next to a picture  = 3	Showing an understanding of the five principles (see progression of skills section). Children will develop on from counting real objects to counting objects in pictures
3 + 1 = Counting one more 	Children to write the sum but to use tangible objects to calculate one more.
2 + 3 = At a party, I eat 2 cakes and my friend eats 3. How many did we eat altogether? 	Children draw a picture to help them work out the answer.
Year 1	
7 + 4 = 7 people are on the bus. 4 more get on at the next stop. How many people are on the bus now? ……. …. We would then progress to; **7 + …. = 11**	Children use dots or symbols to represent objects (quicker than drawing a picture) We would then progress to counting on from 7.
5 + 3 = +1 +1 +1  **5 6 7 8 9 10 11** **6 + 4 + 3 =** 	Children use a number line to record jumps made. Using single jumps… or larger jumps.

Year 1/2	
57 + 25 = My sunflower is 57cm tall. It grows another 25cm. How tall is it now? **Method 1**  **Method 2** **57 +25 =**  **Method 3** **57 + 25 =**  	Drawing an **empty number line** helps children to record the steps they have taken in a calculation. Start on 57 count on a jump of 10 to land on 67. Then add on another jump of 10 to land on 77. Then add on 3 to land on 80 then a jump of 1 to land on 81 and 1 to land on 82. Start on 57. Add on 20 to land on 77. Then add 3 to get to 80 then 2. This is much more efficient than counting on in ones. At all times it is important to reinforce number bonds to 10. Start on 57. Add on 20 to land on 77 then add 5 to land on 82. Children may also **partition** numbers – **57 + 25 =** **50 + 20 = 70** **7 + 5 = 12** **70 + 12 = 82**
7+9=  **13 + 19=**  	Draw an empty number line. Children will be taught to place the largest number at the left side of the line. Add 1 to get to 10. Then add the 6. This method is also used when adding 19, 29, 39 etc
7 + 9 = (7 + 10) – 1= 16  (Using number line to record)	Children use a sound understanding of adding 10 to adapt calculations. Instead of adding 9, they add 10 then **adjust** the calculation by subtracting 1. This is also used for adding other numbers e. g. 15 + 19 (15 **+ 20**, - 1) This is a mental strategy
127 + 74 = There are 127 boys and 74 girls in a school. How many children are there altogether?  	Children will start their number line at 127. Add a jump of 70 to 197. Either add 3 then 1 or simply a jump of 4 to land on 201.

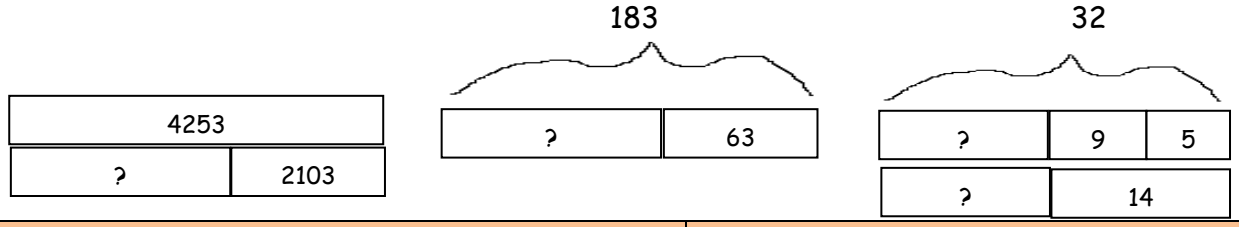
Year 2	
20 + 4 30 + 5 50 + 9 2 4 + 3 5 5 9	Children will be introduced to a formal written method. No carrying is involved at this early stage and the expanded method should be taught first to ensure children understand the place value. The value of the numbers should not exceed 2 digits.
Year 3	
1 2 7 + 7 4 100 + 20 + 7 + 70 + 4 100 + 90 + 11 =201	Children will be taught **written method**s for those calculations they cannot do 'in their heads'. **Expanded methods** build on mental methods and make the value of the digits clear to children. The language used is very important **(7+4, 20+70, 100+0, then 100+90+11 - *add this mentally*** *** In this expanded method, when children get to the stage of adding their partitioned digits together they may be required to 'carry' numbers (see below).** The value of the numbers should not exceed 3 digits.
2 9 8 + $_{1}3_{1}5$ 8 6 5 6	When children are confident using the expanded method, this can be 'squashed' into the traditional compact method.
Year 4	
2786 + 2568 = 2 786 people visited the museum last month. The numbers increased by 2 568 this month. How many people altogether visited this month? 2 7 8 6 + $_{1}2$ $_{1}5$ $_{1}6$ 8 5 3 5 4	When children are confident using the expanded method, this can be 'squashed' into the traditional compact method. (Carrying!) The value of the numbers should not exceed 4 digits.
Year 5	
20 + 4 + 0 . 5 + 30 + 9 + 0 . 8 50 + 13 + 1 . 3 = 64 . 3 24 . 5 + 39 . 8 64 . 3 1 1	Add whole numbers up to 5 digits. Decimals numbers will be introduced this year. Children will start with the expanded method to ensure their understanding of place value is secure before moving onto the compact method.
Year 6	
2 4 . 5 6 6 + 3 9 . 7 0 0 $_{1}$ $_{1}$0 . $_{1}$5 6 0 6 4 . 8 2 6	Year 6 will use the compact method and add larger numbers and decimals up to 3 places. In order to keep the place value the children may add 0s in the empty decimal columns.

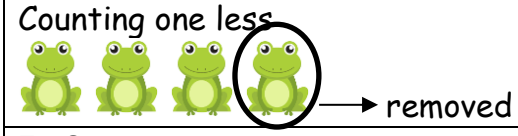
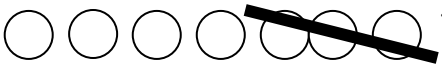
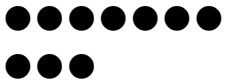
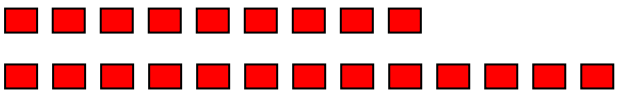
Subtraction

Addition names the whole in terms of the parts and **subtraction** names a missing part of the whole.

Bar modelling

Bar modelling is a method used at all ages. Its focus is on understanding the worded question, not answering it. It is used to record the starting number at the top. The number/s subtracted and the answer are recorded below. Here are a few examples:

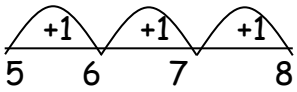


Calculation Method	Explanation
EYFS	
4 – 1 = Counting one less  removed	Children to write the sum but to use tangible objects to calculate one less.
5 - 2 = I had five balloons. Two burst. How many did I have left?  take away	Drawing a picture helps children to visualise the problem. Children also work on counting back from 5
Year 1	
Difference A teddy bear costs £5 and a doll costs £3. How much more does the bear cost?  **? ?**	Drawing a picture helps children to visualise the problem.
7 - 3 = Mum baked 7 biscuits. I ate 3. How many were left?  Take away Lisa has 7 felt tip pens and Tim has 3. How many more does Lisa have?  Find the difference Sarah has 9p and John has 13p. How much more does John have? 	Using dots or tally marks is quicker than drawing a detailed picture.

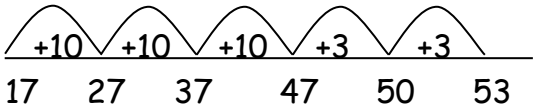
Year 1/2

COUNTING UP/Find the difference

8-5= 3



53-17= 36



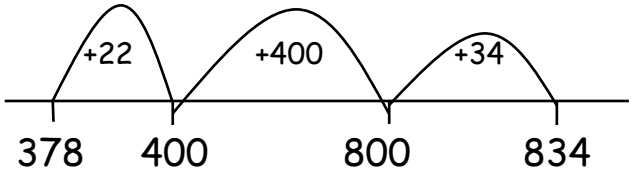
Children are taught to **count up** in order to subtract or '**find the difference**'.

The children count up from 5 in jumps of 1 to get to 8. They then count the jumps to get the answer.

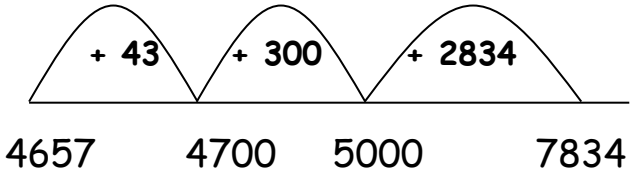
Count up from 17 by adding 3 jumps of 10 (or simply a jump of 30). Then, 2 jumps of 3 to reach 53. Add the jumps up to get 36 which is the difference between the two numbers.

834 - 378 =

The library owns 834 books. 378 are out on loan. How many are on the shelves?



7834 – 4657=



Children could **count up** (from the smallest number to the biggest) using an empty number line. It is easiest to count up to a multiple of 10 or 100 (a friendly number).

This method can be used with any numbers, even decimals.

Year 2

```
  80 + 9
- 50 + 5
  30 + 4 = 34
```

```
  8 9
- 5 5
  3 4
```

Children will be introduced to a formal written method. No exchanging (decomposition) from other columns is introduced at this early stage and the expanded method should be taught first to ensure children understand the place value.

The value of the numbers should not exceed 2 digits.

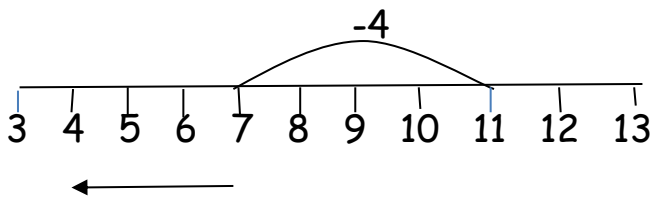
Year 3

Expanded decomposition

```
  749          600  140
- 273   →     700 + 40 + 9
  ———          200 + 70 + 3
               ————————————
               400 + 70+ 6 = 476
```

When children are secure using the column method, expanded decomposition is introduced.

Partition the numbers and set out in **columns**. Always start subtracting the **ones** first.
If the top number is smaller than the bottom number, then you will need to take from the

	column on the left (exchanging a 10 for 10 1s for example). Remember to adjust the columns to show the new amounts. Finally, recombine the answers to give your final answer. The value of the numbers should not exceed 3 digits.
Decomposition 6 1 5 7 2 - 2 4 5 3 2 7	Once the children are secure with expanded, they can move onto to the shortened/compact method. This is just the same as above but the numbers are not partitioned out to see the different columns as clearly.
Year 4	
2 1 3 1 3 5 4 7 - 2 6 2 8 0 9 1 9	The children will use the same methods as year 3; column and decomposition but the value of the digits should not exceed 4 digits.
Year 5	
2 1 3 1 7 1 3 5 4 7 . 8 8 5 - 2 6 2 8 . 2 7 8 0 9 1 9 . 6 0 7	The children will use the same methods as in years 3 and 4; column and decomposition but the value of the digits should not exceed 5 digits. Decimals will be introduced up to 3 decimal places – in this instance, expanded decomposition should be taught first to ensure all children understand the place value.
Year 6	
2 1 3 1 7 1 3 5 4 7 . 8 8 5 - 2 6 2 8 . 2 7 8 0 9 1 9 . 6 0 7	The children will use the same methods as in years 3, 4 and 5; column and decomposition with a range of larger numbers.
7 - -4  	They will also add and subtract negative integers – this will be done using a number line to begin with.

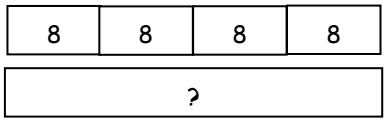
Multiplication

Multiplication and **division** are connected.
Both express the relationship between a number of equal parts and the whole.

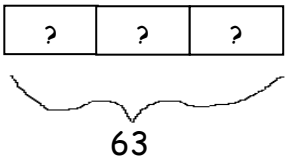
Bar modelling

Bar modelling is a method used at all ages. Its focus is on understanding the worded question, not answering it. Here are a few examples showing how it can be used to show a worded multiplication problem:

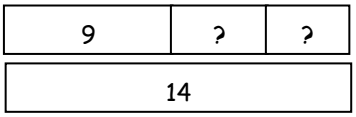
8 x 4 = ?

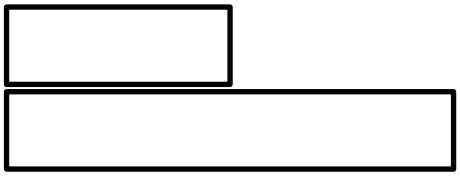
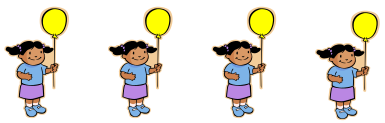
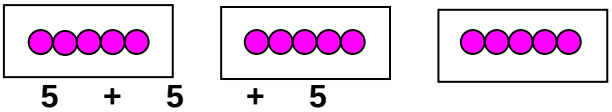


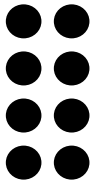
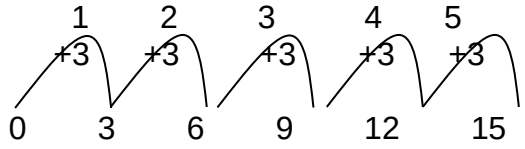
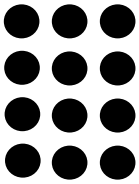
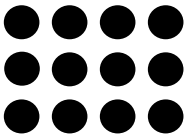
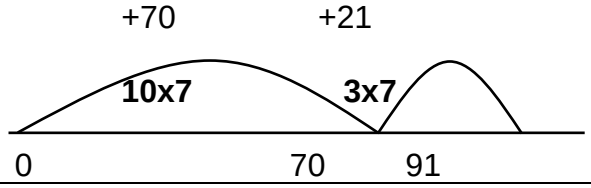
3 x __ = 63



9 + 2M = 14



Calculation Method	Explanation
EYFS	
Doubling 	Children draw or stick in something before repeating with double the amount.
Year 1	
2 x 4 = Each child has two feet. How many feet do four children have?  **2 + 2 + 2 + 2**	A **picture** can also be useful for early multiplication. We say “2 four times.”
5 x 3 = There are 5 cakes in a pack. How many cakes in 3 packs?  **5 + 5 + 5**	Dots or tally marks are often drawn in groups. This shows 3 groups of 5.

2 x 4 = A sweet costs 4p. How much do 2 sweets cost?  2 lots of 4 2 sets of 4 2(4)	Drawing an **array** (**4 rows of 2** or 2 **columns of 4**) gives children an **image** of the answer. It also helps **develop the understanding that 4x is equivalent to 2x4.** **The introduction of brackets is also added 2(4), which means** **2, 4 times.**
3 times table visual aid.  	The children will be taught their times tables and division facts using a number line as a visual aid.
Year 2	
3 x 4 = A sweet costs 4p. How much do 3 sweets cost?  3 lots of 4 3 sets of 4 3(4)	Drawing an **array** (**4 rows of 3** or **3 columns of 4**) gives children an **image** of the answer. It also helps **develop the understanding that 4x3 is equivalent to 3x4.** The introduction of brackets is also added 3(4), which means 3, 4 times.
4 x 3 = A sweet costs 3p. How much do 4 sweets cost?  4 lots of 3 4 sets of 3 4(3)	Drawing an **array** (**3 rows of 4** or **4 columns of 3**) gives children an **image** of the answer. It also helps **develop the understanding that 4x3 is equivalent to 3x4.** **The introduction of brackets is also added 4(3), which means** **4, 3 times.**
13 x 7 = 91 There are 13 biscuits in a packet. How many biscuits in 7 packets?  	When numbers get bigger, it is inefficient to do lots of small jumps. **Split 13 into parts** (<u>10 and 3</u>). This gives you **two jumps** (**10x7** and **3x7**). The answer is the number you land on 91.

Year 3	
Mental Strategy **26 x 7 =** Partitioning. 20 x 7= 140 6x 7= 42 140 + 42= 182 KNOWN FACTS 2 x 7 = 14 20 x 7=140	Children use the partitioning method to multiply mentally and when multiplying by a single digit. Partition 26 (into 20 and 6) and use KNOWN FACTS to multiply by 7. 2x7=14 so 20 x 7=140 6x7= 42 Then add the answers together 140 + 42 = 182. This is a mental strategy
Mental Strategy Grid multiplication 54 x 7 = X | 5 0 | 4 7 | 3 5 0 | 2 8 = 3 7 8 KNOWN FACTS 5 x 7 = 35 5 x 70 = 350	Split up the numbers and multiply each part. Remember to write down KNOWN FACTS. **Add across the rows**, **then add those two answers together.**
Expanded Method of multiplication H T U 3 4 x 6 + 2 4 (6 x 4) 1 8 0 (6 x 30) 2 0 4	Children use expanded method to multiply TO x O Starting with the ones column O x O (6 x 4= 24). Place the 4 from 24 into the answer in the ones column and place the 2 tens in the tens column. Then multiply T x O (30 x 6 = 180). Write the 0 in the O column, the 8 in the T column and the 1 in the H column. Add these together to get the answer. This method shows children exactly WHAT they are doing. **Make sure you are referring to the number, not the digit (i.e. 6 x 30, not 6 x 3)**
Short Multiplication H T U 3 4 x 6 2 0 4	Children use short multiplication to multiply TO x O Starting with the ones column O x O (6 x 4= 24). Place the 4 from 24 into the answer in the ones column and carry the 2 tens above the answer in the tens column. Then multiply T x O (30 x 6 = 180). Add your 2 carried tens from above the answer column to equal 200. This is 20 Tens therefore you write 20 in the answer column under H and T. **Make sure you are referring to the number, not the digit (i.e. 6 x 30, not 6 x 3)**
Year 4	

Short Multiplication H T U 3 4 x2 2 6 2 0 4	Children use short multiplication to multiply TO x O **See above** *When teaching the children our dialogue would be:* *Step 1: O x O 4 x 6 = 24, put the 4 in the answer and carry the 2.* *Step 2: T X O 3 x 6= 18 lots of ten, add the 2 = 20 lots of ten. Put the 20 in the answer box. Final answer= 204.* **Make sure you are referring to the number, not the digit (i.e. 6 x 30, not 6 x 3)**
Short Multiplication Th H T U 3 2 5 x 1 3 7 2 2 7 5	Children use short multiplication to multiply HTO x O To understand place value we would explain the following: Starting with O x O (5 x 7= 35). Place the 5 from the 35 into the answer in the ones column and carry the 3 tens above the answer in the tens column. Then multiply T x O (20 x 7= 140) Add your carried 3 tens (140 +30=170) Place the 7 Tens in the Tens column of your answer and carry the 1 hundred above the answer in the hundreds column. Next multiply the H x O (300 x 7= 2100). This is 21 hundreds so now add the carried 1 hundred to make 22 Hundreds (2200). Finally place the 22 under the Th and H columns. Final answer = 2275 *When teaching the children our dialogue would be:* *Step 1- O x O 5 x 7 = 35 put 5 in the answer carry the 3.* *Step 2 T x O 2 X 7 = 14 add the 3 = 17. Put the 7 in the answer carry the 1.* *Step 3- H x O 3 x 7=21 add the 1 = 22. Write 22 in the answer box.* *Final answer = 2275*
Year 5	
Short Multiplication Th H T U 3 2 5 x 1 3 7 2 2 7 5	Children use short multiplication to multiply HTO x O **See above**
Long Multiplication. 59 x 26 Th H T U	*When teaching the children our dialogue would be:* *Step 1: O x O 6 x 9= 54 put the 4 in the answer and carry the 5 above the line.*

5 9 x 32 56 3 5 4 1 1 1 1 8 0 1 5 3 4	*Step 2: O x T 6 x 5= 30. Add the 5 to make 35 lots of ten. Put 35 in the H and T columns. First line answer 354.* *Step 3: Put a 0 in the answer under the ones column (or the first column if there are decimals) to hold the place value as you are about to multiply everything by 10.* *Step 4: T x O 2 x 9=18, put 8 in the tens, carry the 10 tens to become 1 lot of a hundred.* *Step 5: T X T 2 X 5= 10. Add the 1 = 11 lots of a hundred. Put 11 in the Th and H columns. Second line answer 1180.* *Step 6: add first and second line answers together. Final answer= 1534.*
Year 6 As year 5 with larger numbers and decimals	

Although long and short multiplication are the focus of the new curriculum due to them being quicker, the grid method still is important. It is also very effective when they come to algebra.

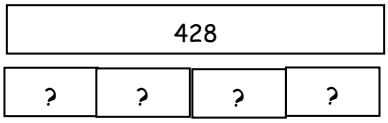
Division

Multiplication and division are connected.
Both express the relationship between a number of equal parts and the whole.

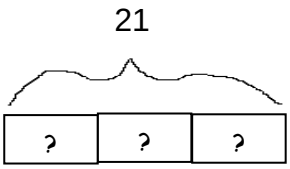
Bar modelling

Bar modelling is a method used at all ages. Its focus is on understanding the worded question, not answering it. Children work a sentence at a time to record information until they understand what is being asked and use a taught method to answer it. Here are a few examples showing how it can be set out for division:

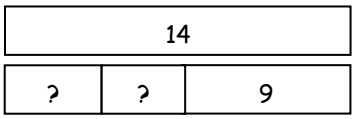
428 ÷ 4 = ?

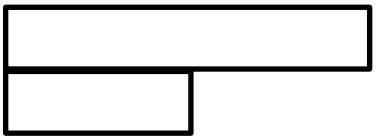
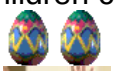


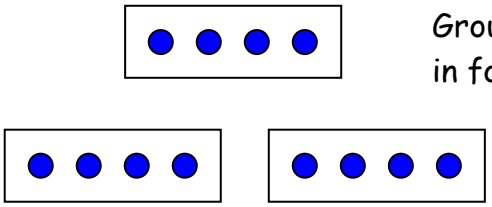
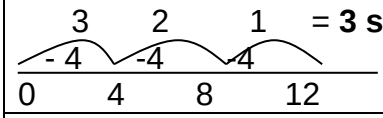
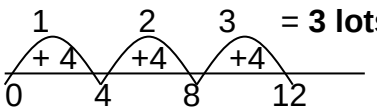
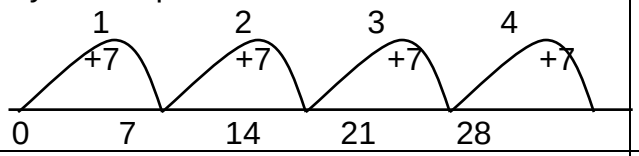
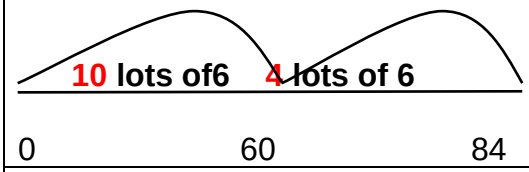
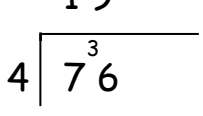
21 ÷ 3 = ?

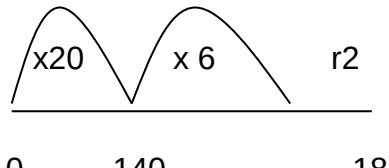


(14 – 9) ÷2 = ?



Calculation Method	Explanation
EYFS	
Halving  	Children will start by finding halves of real items. They will often cut the items to show half and pictures will be used. After sticking in paper, fold and cut another sheet of paper to show half. Some will complete the task with just one sheet.
Year 1	
6 ÷ 2 = 6 Easter eggs are shared between 2 children. How many eggs do they get each?   Sharing between 2 There are 6 Easter eggs. How many children can have two each? Grouping in twos      	More pictures! Drawing often gives children a way into solving the problem.

Year 1/2	
12 ÷ 4 = 4 apples are packed in a basket. How many baskets can you fill with 12 apples?  	Dots or tally marks can either be shared out one at a time or split up into groups.
Year 2	
12 ÷ 4= 3  = **3 sets of 4**	Using the pictorial example above, we would then progress to transferring this to a number line by taking out sets of 4 and counting down.
12 ÷ 4= 3  = **3 lots of/sets of 4**	The above method would progress into a number line. When you add on **'lots of 4' or 'sets of 4'** until you reach 12. You then count up how many lots of 4 you have added on to get the answer **3**.
Year 3	
Mental Strategy **28 ÷ 7 = 4** A chocolate bar costs 7p. How many can I buy with 28p?  	To work out how many lots of 7 there are in 28, draw **jumps** of 7 along a **number line. This shows you need 4 jumps of 7 to reach 28.**
Mental Strategy **84 ÷ 6 =**  	It would take a long time for the children to jump in sixes to 84 so children can jump on in bigger '**jumps**'. A jump of 10 groups of 6 takes you to 60. Then you need another 4 lots of 6 which is 24 will take you to 84. Altogether this is **14 sixes.** Calculations should be 2 digit by 1 digit.
Short Division  	Teacher would explain to the children that we ignore place value when teaching short division as a strategy. Firstly, work out how many fours fit into 7. Write the **answer above** 7 and the **reminder** in front of the next digit of the number to be divided.

	Then count up in fours to see how many now fit into 36 and write the answer above the digit 6. If the divisor does not fit exactly into the final number, you will be left with a remainder to be recorded next to your answer. Remainders can be interpreted as fractions, decimals or rounding. E. g. 36 ÷ 5 = 7 r1 = 7 1/5 = 7. 2 = 7 (rounded to the nearest whole number)
Year 4/5	
Mental Strategy **184 ÷ 7 =** I need 184 chairs for a concert. I arrange them in rows of 7. How many rows do I need?  KNOWN FACTS 7 x 2 = 14 7 x 20=140 If the number you are dividing by (7) cannot go into the number any more, this is the remainder!	This method is known as **counting up on a number line.** In this example, you are counting up in jumps of 7. Using their **KNOWN FACTS** children will know 7 x 2=14 so 7 x 20=140 So first add on a jump of 20 lots of 7 and land on 140. You are left with 44. Cont. . . Then add on a jump of 6 lots of 7 which is 42 and land on 182, to leave 2. Altogether, that is 26 sevens with a remainder of 2. Calculations should be 2 or 3 digit by 1 digit and children should be taught to interpret the remainder appropriately. In year 5 children will divide up to 4 digits by a 1 digit number and 10 and interpret remainders appropriately.

Year 5/6	
Short Division 19 r 3 4 | 76	Firstly, work out how many fours fit into 70. Write the **answer above** 7 and the **reminder** in front of the next digit of the number to be divided. Teacher would explain to the children that we ignore place value when teaching short division as a strategy. Then count up in fours to see how many now fit into 36 and write the answer above the digit 6. If the divisor does not fit exactly into the final number, you will be left with a remainder to be recorded next to your answer. Remainders can be interpreted as fractions, decimals or rounding. E.g. 36 ÷ 5 = 7 r1 = 7 1/5 = 7.2 = 7 (rounded to the nearest whole number)
120 r 5 8 | 9(1)65 120.625 8 | 965.(5)0(2)0(4)	Remainders can be interpreted as fractions, decimals or rounding. E. g. 965 ÷ 8 = 120 r5 = 120 5/8 (5 of the original 8 leftover) = 120. 625 = 121 (rounded to the nearest whole number) Examples will be taught and practised that include 0 and when divisors divide exactly.
Year 5/6	
Chunking **468 ÷ 15 =** 15 | 468 - 300 (x20) 168 -150 (x10) 018 -015 (x1) 3 (the remainder) 15 x 5 = 75 15 x 10 = 150 15 x 20 = 300 15 x 40 = 600	Begin by calculating the 10, 20, 40 and 5x table of the 15 times tables. Calculate 5x after 10x as all you need to do is half 10x. Take 20 ‘chunks’ of 15 away from the original number. (468 – 300) Take 10 ‘chunks’ away (168 – 150). Take 1 more ‘chunk’ away (18 – 15). Add the ‘chunks’ (31) Whatever you are left with is your remainder. **Answer = 31 r 3**

Long Division	Teacher would explain to the children that we ignore place value when teaching long division as a strategy. Long division requires the children to be competent and confident with their tables, and subtraction before they can use it as a division strategy. 468 ÷ 15 How many 15s in 4? The answer is 0 so this is placed above the 4, above the division gate. The next question is how many 15s are in 46? (We have put the 4 and 6 together to make 46 lots of ten). The answer is 3 lots of ten, so this is placed above the 6- above the division gate. 30 x 15 is 450, this is written under the 468 and a subtraction calculation is done to work out the remainder which is 10. The remaining digit (8) is then brought down to join the 10 to form 18. So the next question we ask is; how many 15s are there in 18? The answer is 1, so this is written above the 8, above the division gate. 1 x 15 is 15, this is written under the 18 and a subtraction calculation is done to work out the final remainder, which in this example is 3. This remainder could then be represented at 3/15 or the simplified to 1/5 or then put into a decimal of 33. 2

```
   0 3  1 r 3
  ____________
15|4 6 8
   4 5 0     (30 lots of 15)
   -----
   0 1 8
     1 5     (1 lot of 15)
     ---
     0 3
```