Hazelwood Schools

Maths and Calculation Policy

Reviewed and Adopted: **Spring 2022**

Reviewed by: SLT/LTS committee

Next Review: **Spring 2025**

Review every three years

Intent

At Hazelwood Schools, we believe that Maths is an essential part of everyday life. Learning is, therefore, focused on children securing a strong conceptual understanding of Maths and developing the skills and self- confidence required to apply their mathematical knowledge to creatively solve problems.

At Hazelwood, we believe that the use of manipulatives is fundamental in supporting children to bridge the gap from the abstract to the tangible. Children first gain a conceptual understanding through the use of practical equipment before representing problems pictorially. The use of manipulatives enables children to gain a secure understanding of Maths which can be used to support their use of written methods.

When planning, we use the White Rose scheme of work to support children's application of Maths. White Rose is a clearly sequenced scheme that builds children's knowledge over time, matching to our Hazelwood Maths Vision (see below). We adapt and tailor the scheme to support the differing needs of our children across the school.

Children are taught a range of written methods which build upon their conceptual knowledge and enable children to efficiently calculate using mathematical operations. Children are taught these methods in conjunction with mental strategies which help children to become fluent mathematicians. Strategies for calculation need to be supported by familiar models and images to reinforce understanding. When teaching a new strategy, it is important to start with numbers that the child can easily manipulate so that they can understand the concept.
The aim is for all children to be confident in at least one written method for each of the four operations which is reliable and efficient.

The National Curriculum for Mathematics aims to ensure that all children:

- become fluent in the fundamentals of Mathematics, including through varied and frequent practice with increasingly complex problems over time, so that children develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

(National Curriculum – Mathematics Programmes of Study, DFE 2014)

Hazelwood Schools Maths Vision

At Hazelwood, we want all children to enjoy Maths and have a love of learning Maths. We encourage them to understand that a problem is only a problem if they cannot solve it, to persevere, to have self-belief and the determination to succeed in solving the problems in order to be the best mathematicians that they can be.

Our aims in the teaching of Mathematics are:

- To promote enjoyment of learning through practical activity, exploration and discussion;
- To promote confidence, enthusiasm and a sense of achievement;
- To promote a high standard in Maths and a range of mathematical skills;
- To develop the ability to solve problems through decision making and reasoning in a range of contexts; routine and non-routine problems;
- To develop a practical understanding of the ways in which information is gathered and presented;
- To explore features of shape and space and develop measuring skills in a range of contexts;
- To calculate accurately, both mentally and with pencil and paper, drawing on a range of calculation strategies;
- To understand the importance of mathematics in everyday life.
- To encourage pupil voice to justify and reason in mathematics

In line with the 2014 Maths Curriculum, we have adopted a 'Mastery for All' approach in the teaching and learning of Mathematics here at Hazelwood. Mastery is something that we want all children to acquire. A 'Mastery Maths

Curriculum', or 'Mastery Approaches' to teaching Maths, both have the same aim; to help children, over time, acquire mastery of the subject which is a deep, long-term, secure and adaptable understanding of the subject.

Mastery of Maths, which should build gradually as a child goes through school, is a tool for life, and immeasurably more valuable than the short-term ability to answer questions in tests or exams.

Mathematics is an interconnected subject in which children need to be able to move fluently between representations of Mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but children should make rich connections across Mathematical ideas to develop fluency, Mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their Mathematical knowledge to Science and other subjects.

The expectation is that the majority of children will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.

Children who grasp concepts rapidly should be challenged through rich and sophisticated problems before any acceleration through new content. Those children who are not sufficiently fluent with earlier material should consolidate their understanding, through additional practice, before moving on. (National Curriculum, 2014)

We use a variety of curriculum resources to support this mastery approach, including White Rose Maths Hub schemes of work, Nrich and NCETM (National Centre for Excellence in the Teaching of Mathematics) resources which ensure continuity and progression in the teaching of Mathematics.

Implementation

Early years Foundation Stage (EYFS)

We value the important part the EYFS plays in developing the necessary building blocks for children to excel mathematically. Work undertaken within the EYFS is guided by the requirements and recommendations set out in the Early Years Foundation Stage Statutory Framework 2021. Our children's Mathematical ideas are also explored through stories and focused around a child's contextual understanding and real-life experiences. Practitioners are interested in children's ideas and value all children's contributions. They foster a positive attitude and interest in Maths right from the start, encouraging children to 'have a go' and not be afraid to make mistakes. Our enabling environments, quality interactions and adult-focus sessions aim to deepen understanding. We provide all children with opportunities to develop their problem solving, reasoning and Maths skills to further develop an understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore and talk confidently about Mathematics.

Nursery and Reception classes have access to a wide range of activities and resources that enable children to practise and apply Mathematical learning, some are listed below,

- Observation of number and pattern in the environment and daily routines;
- Board games;
- Large and small construction;
- Loose parts play;
- Stories, songs, rhymes and finger games;
- Sensory, sand and water exploration;
- Two- and three- dimensional work with a range of materials;
- Imaginative play;
- Cooking and shopping;
- Outdoor play and 'playground' games.

During the day the children will take part in adult-led activities. As children move through the EYFS at Hazelwood, the balance of adult-led and child-initiated learning opportunities change in preparation of the more formal learning in Year 1.

In our Nursery, these take the form of very brief carpet sessions or small group sessions relevant to the stage of development of the children and include opportunities for singing, rhyming, counting and listening to stories.

In our Reception classes, these will take the form of daily Maths carpet sessions and weekly focus group activities. Our teacher-led sessions are carefully planned and tailored for the children in the class using previous assessments of the children's knowledge, skills and ability. These sessions are continuously adapted in order to ensure that they are relevant and challenging for every child.

The Structure for the Teaching of Mathematics

The Mathematics curriculum is structured around the National Curriculum and its yearly teaching programmes.
This yearly teaching programme is taught through daily Mathematics lessons of approximately 45minutes at the start of Key Stage One (KS1) extending to an hour in Key Stage Two (KS2). Teachers are encouraged to deliver Maths teaching in an agile teaching approach, where children enter the lessons with challenges to tackle straight away. Teachers expose the children to the challenge of open-ended tasks where less teacher talk is necessary and more mini-plenaries are used to support and extend both teaching and learning.

Our school uses a variety of teaching and learning styles in Mathematics lessons in accordance with the school's Teaching and Learning Policy. Our principal aim is that children will:

- Experience a high proportion of whole class, group-direct teaching, and exploration of ideas with mini-plenaries to extend learning.
- Be encouraged to ask as well as answer Mathematical questions.
- Have the opportunity to use a wide range of resources and manipulatives, such as number lines, number squares, digit cards, Numicon, Dienes, Place Value Counters and Cuisenaire Rods.
- Use computing and technology in Mathematics lessons to enhance and/or support their learning.
- Wherever possible be encouraged to apply their learning to everyday situations.

It is important that children are allowed to explore Maths and present their findings not only in written form but also visually; to that end, the school will adopt the 'CPA approach': Concrete, Pictorial and Abstract. This will allow children to experience the physical aspects of Maths before finding a way to present their findings and understandings in a visual form before relying on the abstract numbers. The manipulatives mentioned above are available in each classroom to help facilitate this process.

Levels of Challenge

Differentiation is achieved by emphasising deep knowledge and through individual support and intervention - through enabling the children to access what is being taught. Questioning and scaffolding vary to further support individual progress within lessons. All children are given ample opportunities to extend and further apply their learning once they show a solid understanding of the lesson objective. Misconceptions are dealt with immediately.

In all classes, children have a range of Mathematical abilities. We recognise this fact and provide suitable learning opportunities for all children by placing them in classes of mixed abilities groups for Maths lessons. We believe that this approach is of great benefit to all children and continues to promote a 'Mastery for All' approach. We achieve this through a range of strategies, such as by organising the children to work in groups or pairs on open-ended problems or games. We use teaching assistants (TAs) to support some children inside the classroom to ensure that all individual children experience inclusion within Mathematics. In upper KS2 classrooms, we are sometimes able to downsize (make numbers of children in classes smaller) by deploying a highly-skilled member of staff to teach an additional group.

Teaching Mathematics to Children with Special Educational Needs (SEN) and More Able Children

We ensure that all children have access to the National Curriculum. It is part of the schools' Teaching and Learning Policy to provide a Real, Relevant, Immersive and Purposeful curriculum so that all children can achieve educational excellence, in line with our schools' vision.

SEN Children:

- Learning Opportunities are matched to the needs of children with learning difficulties.
- Targets that are set for individuals in a Learning Support Plans (LSP) are considered in daily planning.
- Pupils with learning difficulties in Mathematics may receive extra support from a TA in order to consolidate and reinforce basic skills.

More able Children:

- All lessons involve challenges of non-routine problems to stretch and broaden the understanding of the more able children.

Assessment for Learning

- Formative assessment is used to guide the progress of individual children in Mathematics. It involves identifying each child's progress against the key objectives determining any gaps individuals or groups of children have in their knowledge; what they have learnt securely; and what should be the next stage in their learning.
- Staff assess children's work throughout three aspects: long-term, medium-term and short-term.
- Staff carry out short-term assessments (formative assessment) which are used to inform daily plans. These short-term assessments are closely matched to the teaching objectives.
- Medium-term assessments are used to measure progress against the key White Rose end of block objectives and to help staff plan the next sequence of work. Teachers use assessments appropriate to the level of the children which help them identify the specific level the children are at and use NFER termly tests (past SATs papers for Year 6) to assess children's understanding.
- Long-term assessments are used towards the end of the year using formal end of year tests as well as teacher assessments. In Year 2 and Year 6 staff use the official National Tests known as SATs. Children at the end of Year 1, 3, 4 and 5 are given NFER Assessments and the optional White Rose Assessments.
- Teachers use the information from the medium-term and long-term assessments to assess the progress made by each child throughout the year.
- In the EYFS teachers use a range of non-statutory documents to support teacher judgments of children's attainment throughout the year; including Development Matters 2021.
- At the end of the EYFS, in Reception, practitioners complete the Statutory EYFS Profile for each child. In Maths pupils are assessed against the Early Learning Goals in Number and Numerical pattern as either:
    - Meeting expected levels of development (Expected)
    - Not yet reaching expected levels (Emerging)

Feedback to Children and Targets

Feedback to children about their progress in Mathematics is given through effective formative assessment which:

- Aims to be encouraging and supportive and move children on;
- Includes 'next step marking' which is often carried out through discussion between child and teacher during a task;
- May on occasions be carried out by children marking their own or each other's work when this is thought to be appropriate or effective.

Contribution of Maths to Other Subject Areas

Computing

Computing enhances the teaching of Mathematics significantly. We believe that using computer software, Google Chrome Books and the Interactive Whiteboards as much as possible and where applicable to the task allows for the presentation of information visually, dynamically and interactively, so that children can understand concepts more quickly.

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening specifically through justification and reasoning activities.

Science

Almost every scientific investigation or experiment is likely to require one or more of the Mathematical skills of classifying, counting, measuring, calculating, estimating and recording in tables and graphs. In Science children will for example order numbers, including decimals, calculate simple means and percentages, use negative numbers when taking temperatures, decide whether it is more appropriate to use a line graph or bar chart, and plot, interpret and predict from graphs. There is useful information within the National Curriculum in relation to 'cross-curricular' aspects of Mathematics and Science.

Art, Design and Technology

Measurements are often needed in Art and Design and Technology. Many patterns and constructions are based on spatial ideas and properties of shapes, including symmetry. Designs may need enlarging or reducing, introducing ideas of multiplication and ratio. When food is prepared a great deal of measurement occurs, including working out times and calculating cost; this may not be straightforward if only part of a packet of ingredients has been used.

History, Geography and Religious Education (RE)

In History and Geography children will collect data by counting and measuring and make use of measurements of many kinds. The study of maps includes the use of co-ordinates and ideas of angle, direction, position, scale and ratio. The pattern of the days of the week, the calendar and recurring annual festivals all have a mathematical basis. For older children historical ideas require understanding of the passage of time, which can be illustrated on a time line, similar to the number line that they already know.

Physical Education (PE) and Music

Athletic activities require measurement of height, distance and time, while ideas of counting, time, symmetry, movement, position and direction are used extensively in Music, Dance, Gymnastics and ball games.

Personal, Social and Health Education (PSHE) and Citizenship

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

Reporting

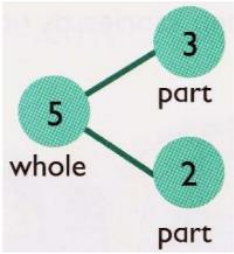
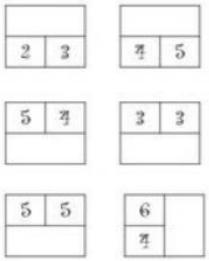
Reporting to parents is done three times a year. Through consultation evenings and the annual end of year written report. Reporting in Maths will focus on each child's:

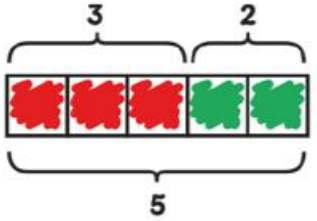
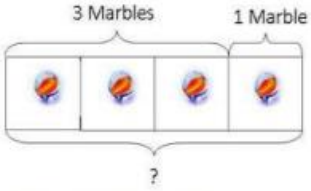
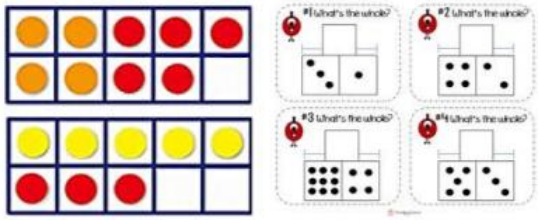
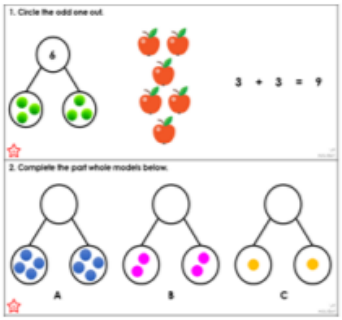
- Attitude to Mathematics
- Competence in basic skills and developing Mathematical expertise
- Ability to apply Mathematical knowledge to new situations.
- Review and setting of targets

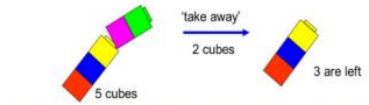
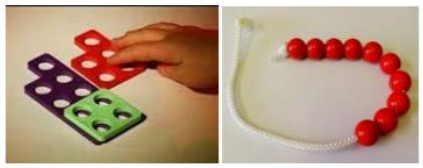
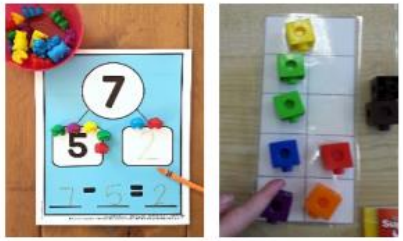
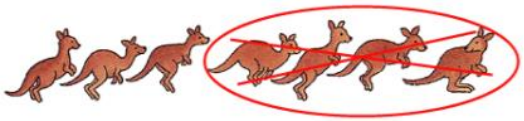
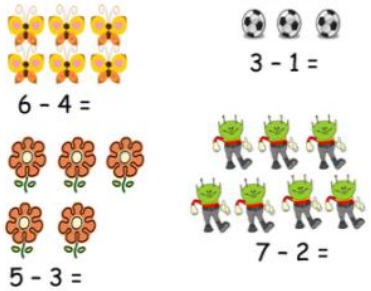
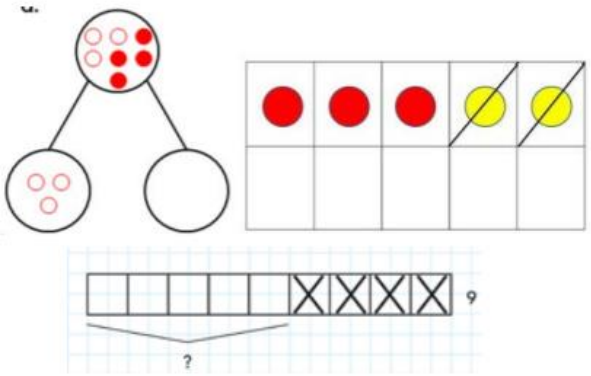
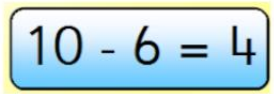
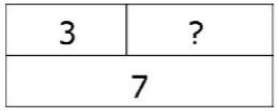
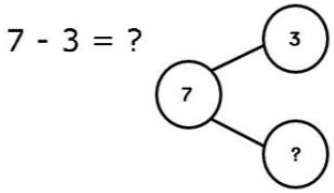
Concrete – Pictorial – Abstract Progression Documents:

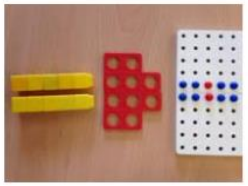
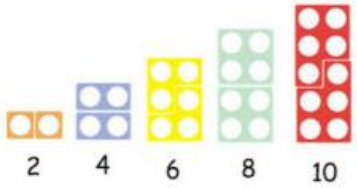
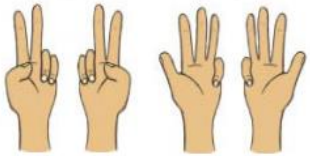
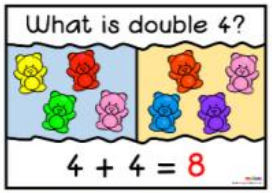
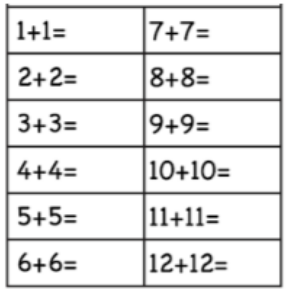
The principle of the Concrete-Pictorial-Abstract (CPA) approach (*Make it, Draw it, Write it*) is for children to have a true understanding of a Mathematical concept. Children are expected to *master* all three phases within a year group's scheme of work.

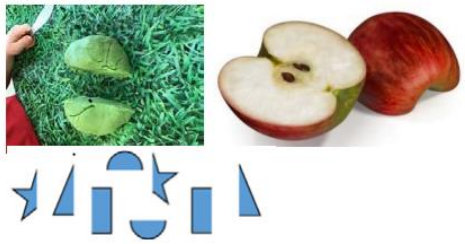
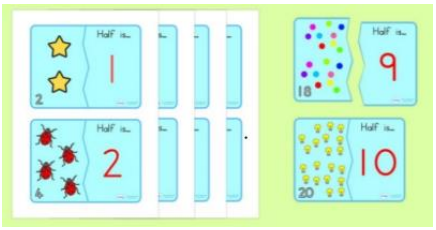
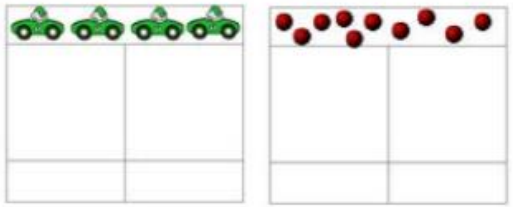
The tables below show how different strategies are taught for the four operations (addition, subtraction, multiplication and division) and how these build over time leading to progress year on year. They also show a progression of the CPA approaches with examples of what concrete materials can be used and how, along with suggested pictorial representations for each strategy.

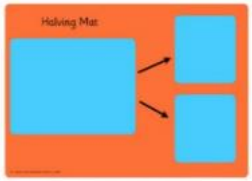
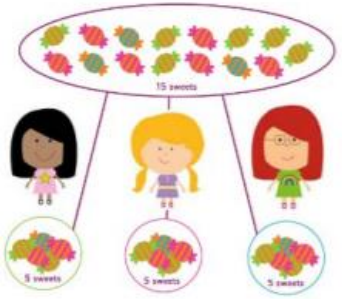
Objective and Strategies	Concrete	Pictorial	Abstract
		# Addition- EYFS	
Know that a group of things change in quantity when something is added Find the total number of items in two groups by counting all of them Can say the number that is one more than any given number Find one more from a group of up to five objectives, then 10 objects In practical activities and discussion, beginning to use the vocabulary involved in adding Using quantities and objects, they add two single digit numbers and count on to find the answer Solve problems	 Use toys and general classroom resources for children to physically manipulate, group and regroup quantities.    Use specific maths resources such a snap cubes, Numicon, bead strings to support with adding.	 Two groups of pictures so children are able to count the total visually.	5+2=7   A focus on symbols and numbers to form a calculation. *No expectation for children to be able to record a number sentence or addition/subtraction calculation.

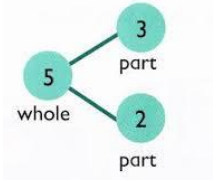
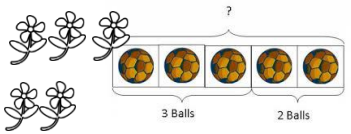
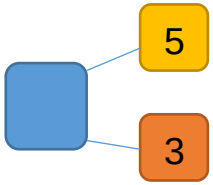
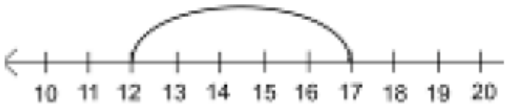
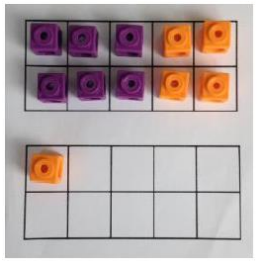
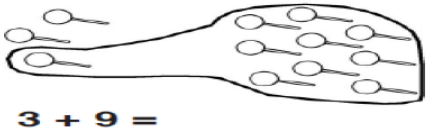
involving doubling	 Use visual supports such as ten frames, part-part-whole and addition mats, with the physical objects and resources that can be manipulated.	  Bar model using visuals, pictures and icons or colours.   Use visual supports such as ten frames, part-part-whole and addition mats with pictures and icons.	

Objective and Strategies	Concrete	Pictorial	Abstract
		<u>Subtraction- EYFS</u>	
Know that a group of things change in quantity when something is taken away Find one less from a group of five objects, then ten objects In practical activities and discussion, beginning to use the vocabulary involved in subtracting Using quantities and objects, they subtract two single digit numbers and count back to find the answer	 Use toys and general classroom resources for children to physically manipulate, group and regroup quantities.   Use specific maths resources such a snap cubes, Numicon, bead strings to support with subtracting.  Use visual supports such as ten frames, part-part-whole and subtraction mats, with the physical objects and resources that can be manipulated.	  A group of pictures for children to cross out or cover quantities to support subtraction.  Use visual supports such as ten frames, part-part-whole and bar models with pictures and icons.	    A focus on symbols and numbers to form a calculation. *No expectation for children to be able to record a number sentence or addition/subtraction calculation.

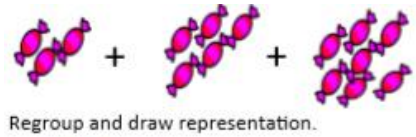
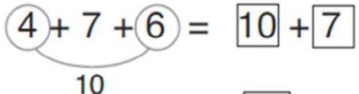
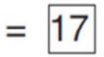
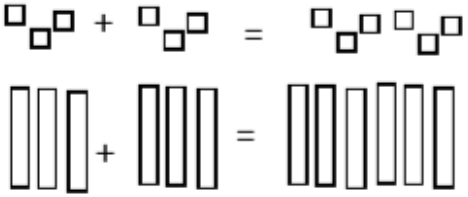
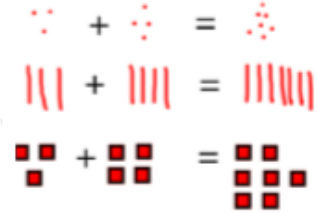
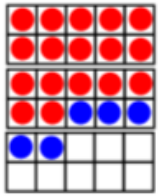
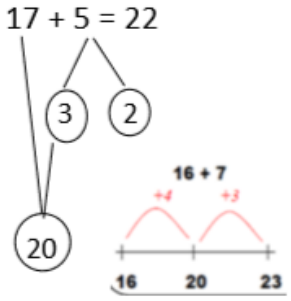
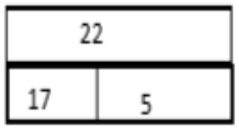
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Multiplication- EYFS</u>			
Solve problems involving doubling	   Counting and other maths resources for children to make 2 equal groups.    Physical and real-life examples that encourage children to see the concept of doubling as adding two equal groups.	    Pictures and icons that encourage children to see concept of doubling as adding two equal groups.	 Addition calculations to model adding two equal groups.

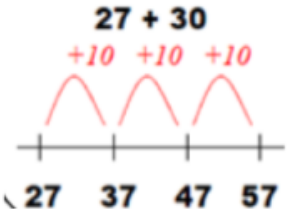
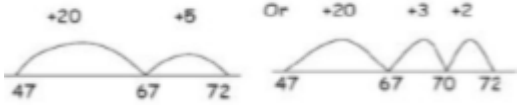
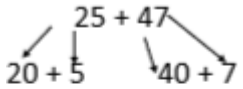
Objective and Strategies	Concrete	Pictorial	Abstract
		Division- EYFS	
Solve problems including halving and sharing, including: • Halving a whole, halving a quantity of objects • Sharing a quantity of objects	 Children have the opportunity to physically cut objects, food or shapes in half.  Counting and other maths resources for children who share into two equal groups.	 Pictures and icons that encourage children to see concept of halving in relation to subitising, addition and subtraction knowledge. For example, knowing 4 is made up of 2 groups of 2 – so half of 4 is 2.  Bar model with pictures or icons to support understanding of finding 2 equal parts of a number, to further understand how two halves make a whole.	

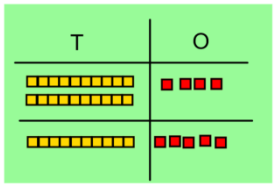
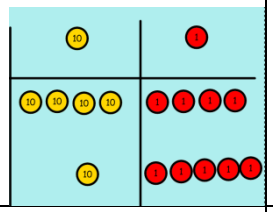
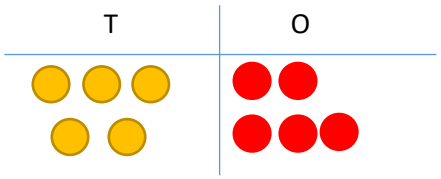
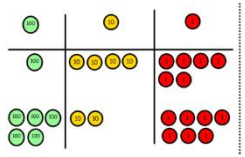
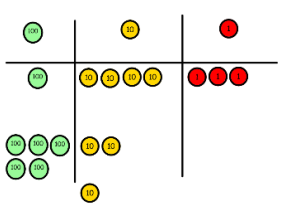
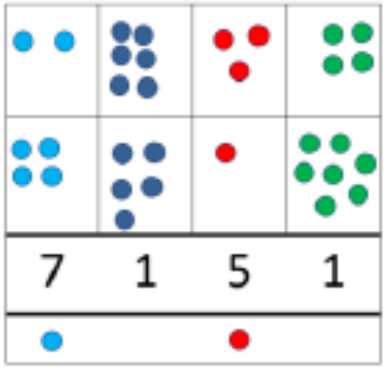
	  Use visual supports such as halving mats and part-part-whole, with the physical objects and resources that can be manipulated.  Counting and other maths resources for children to explore sharing between 3 or more.	 Pictures for children to create and visualise 3 or more equal groups.	

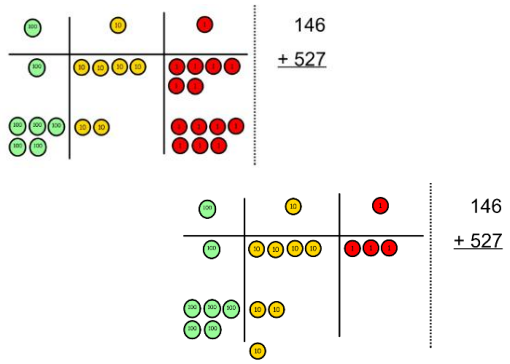
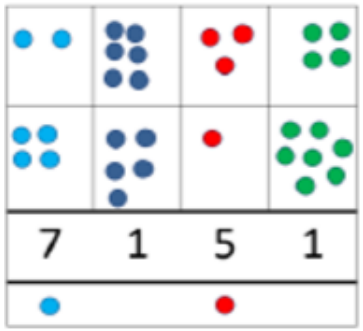
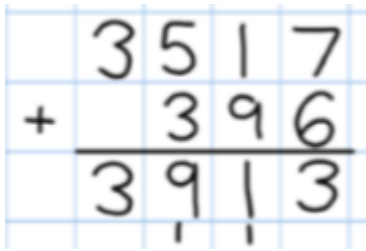
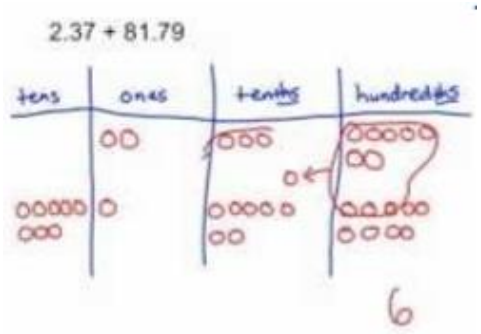
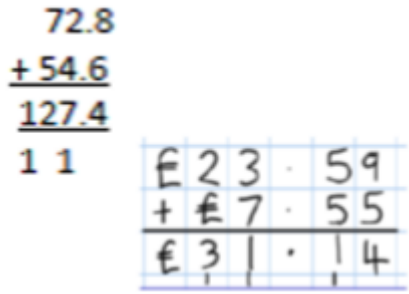
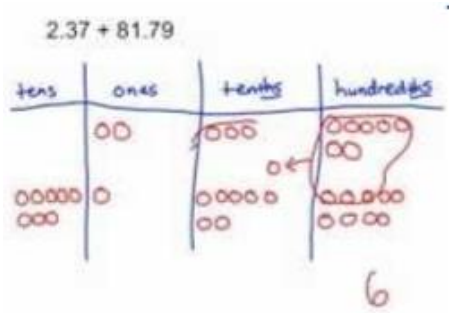
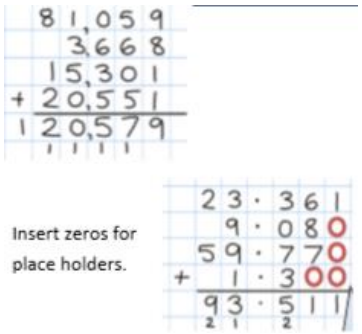
Objective and Strategies	Concrete	Pictorial	Abstract
		<u>Addition - Year 1</u>	
Combining two parts to make a whole: part-part, whole model	  	  	4 + 3 = 7 10= 6 + 4 
Starting at the bigger number and counting on	 Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.	12 + 5 = 17  Start at the larger number on the number line and count on in ones **or** in one jump to find the answer.	5 + 12 = 17 So 12 + 5 = 17 Place the larger number in your head and count on the smaller number to find your answer.
Regrouping to make 10.	6 + 5 = 11  Start with the bigger number and use the smaller number to make 10.	 Use pictures or a number line. Regroup or partition the smaller number to make 10.	7 + 4= 11 If I am at seven, how many more do I need to make 10. How many more are left to add on now?

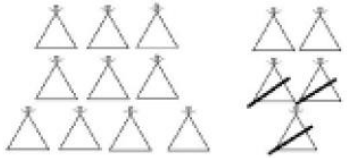
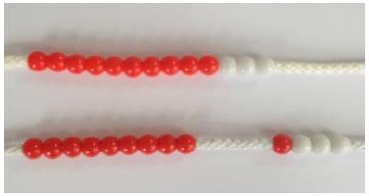
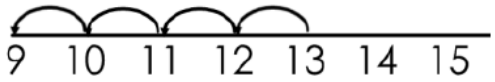
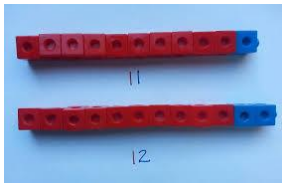
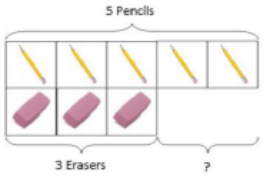
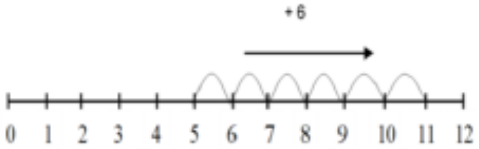
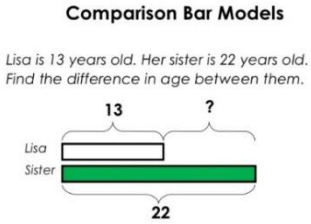
Addition - Year 2

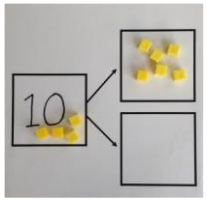
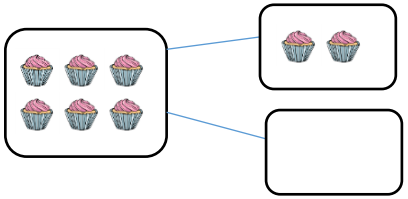
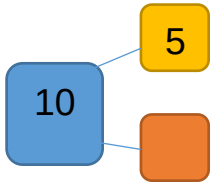
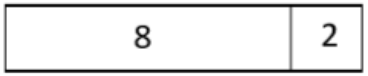
Objective and Strategies	Concrete	Pictorial	Abstract
Adding three single digits	 Combine to make 10 first if possible, or bridge 10 then add the third digit.	 Regroup and draw representation. 	  Combine the two numbers that make 10 and then add on the remainder.
Using known facts	 e.g. doubles	 Children draw representations of H,T and O	3 + 4 = 7 *leads to* 30 + 40 = 70 *leads to* 300 + 400 = 700
Add a two-digit number and ones	 17 + 5 = 22 Use ten frame to make 'magic ten Children explore the pattern. 17 + 5 = 22 27 + 5 = 32	Use part part whole and number line to model. 	Explore related facts 17 + 5 = 22 5 + 17 = 22 22 – 17 = 5 22 – 5 = 17 

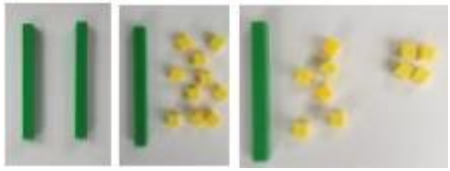
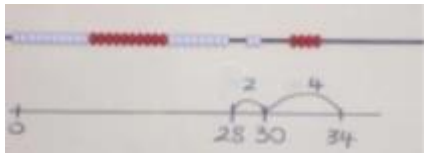
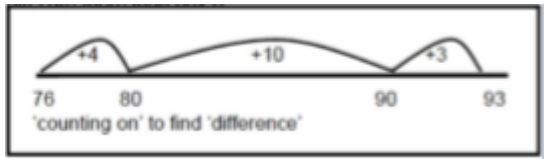
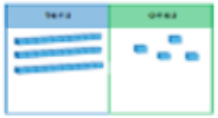
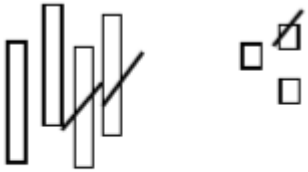
Add a 2-digit number and tens	 25 + 10 = 35 Explore that the ones digit does not change		27 + 10 = 37 27 + 20 = 47 27 + □ = 57
Add two 2-digit numbers	 Model using dienes , place value counters and numicon	 Use number line and bridge ten using part-part whole is necessary.	 20 + 40 = 60 5+ 7 =12 60 + 12 = 72 Use partitioning of tens and ones and regroup.

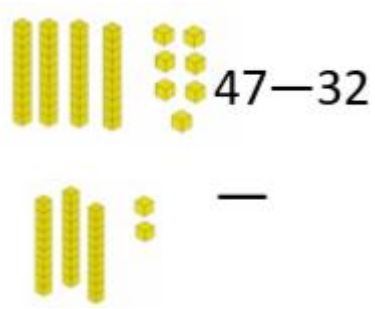
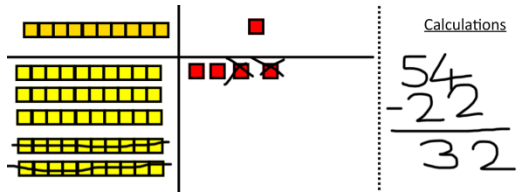
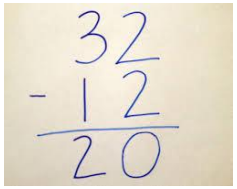
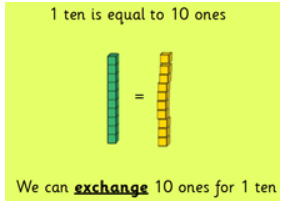
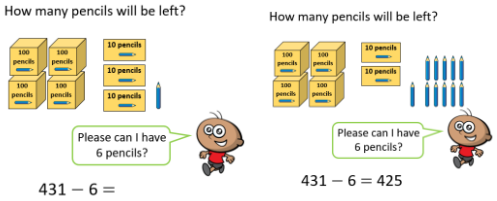
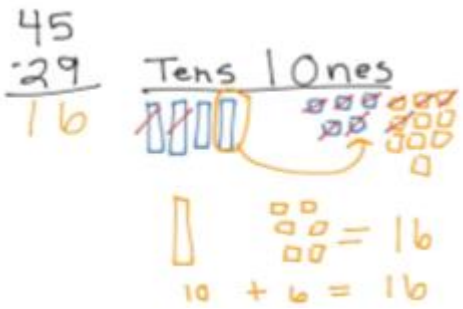
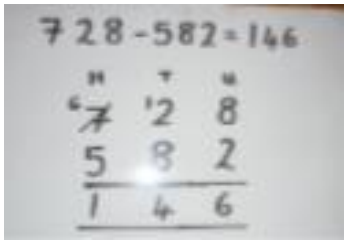
Objective and Strategies	Concrete	Pictorial	Abstract
		Addition - Year 3	
Column method - no regrouping	24 + 15= Add together the ones first then add the tens. Use the Base 10 blocks first before moving onto place value counters.  	After practically using the base 10 blocks and place value counters, children can draw the counters to help them to solve additions. 37 + 18 = 55  	21 + 42 = 21 + 42 Used for calculations where the ones do not require exchanging place value.
Column method - regrouping	Make both numbers on a place value grid.  146 + 527 Add up the ones and exchange 10 ones for one 10. Repeat for each place value column  146 + 527	Children can draw a pictoral representation of the columns and place value counters to further support their learning and understanding.  	536 + 85 621 1 1 Start with the ones, then 10s and so on. Carry over the 10s or 100s.

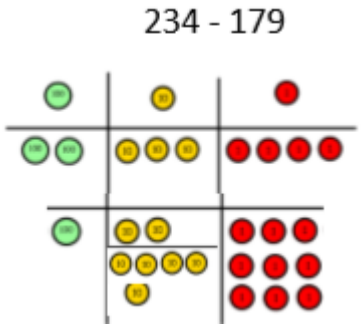
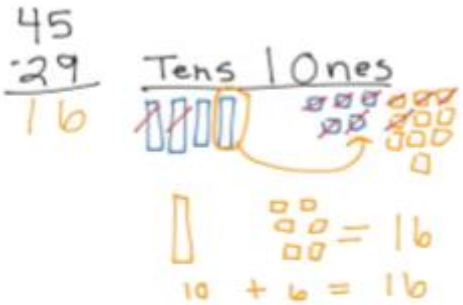
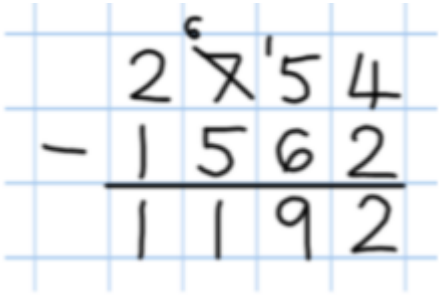
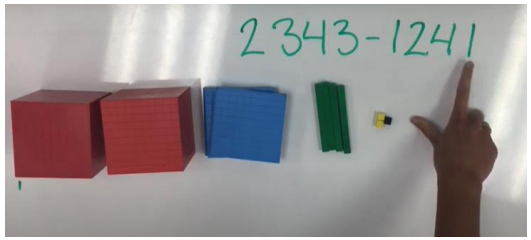
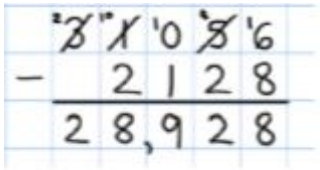
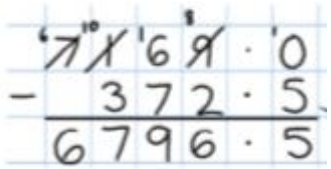
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Addition - Year 4,5 & 6</u>			
Year 4 Add numbers with up to 4 digits			
Year 5 Add decimals with 2 decimal places, including money			
Year 6 Add several numbers of increasing complexity			

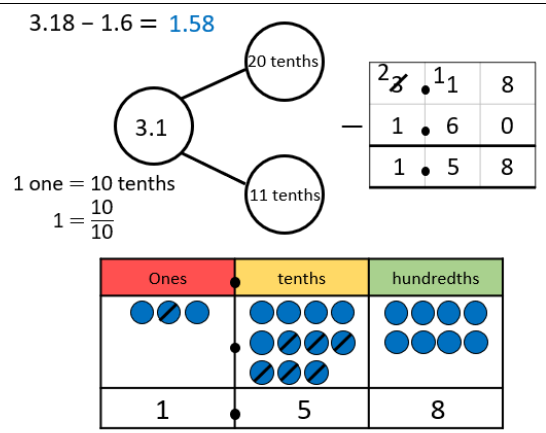
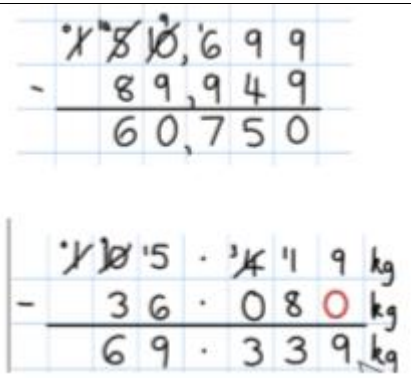
Objective and Strategies	Concrete	Pictorial	Abstract
		Subtraction - Year 1	
Taking away ones	Use physical objects, counters, cubes etc to show how objects can be taken away. 	Cross out drawn objects to show what has been taken away.  15 – 3 = 12	8 – 2 = 6 18 -3 = 15
Counting back	Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones. 13 – 4 	Count back on a number line or number track  9 10 11 12 13 14 15 Start at the bigger number and count back the smaller number showing the jumps on the number line.	Put 13 in your head, count back 4. What number are you at? Use your fingers to help.
Find the difference	Compare amounts and objects to find the difference.  Use cubes to build towers or make bars to find the difference  Use basic bar models with items to find the difference	 Count on to find the difference. Draw bars to find the difference between 2 numbers. 	Hannah has 17 sandwiches, Helen has 8 sandwiches. Find the difference between the number of sandwiches. Use of column subtraction. 41 - 25 ____

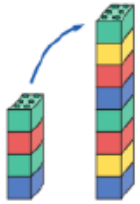
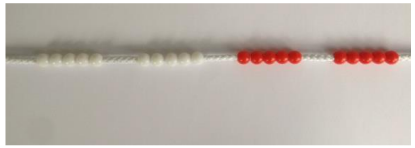
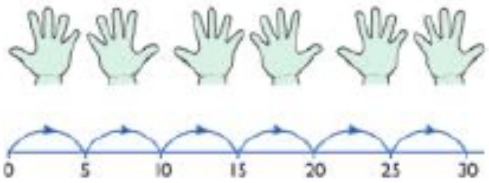
Part-Part, Whole Model	10 - 6 =  Link to addition- use the part, part whole model to help explain the inverse between addition and subtraction. If 10 is the whole and 6 is one of the parts. What is the other part?	Use a pictorial representation of objects to show the part-part, whole model. 	 Move to using numbers within the part-part, whole model.
Bar model	 5—2 = 3	 10 – 2 = 8	10 – 2 = 8  10 = 8 + 2 10 = 2 + 8 10—2 = 8 10—8 = 2

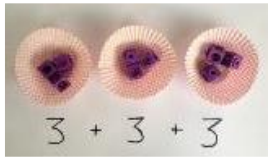
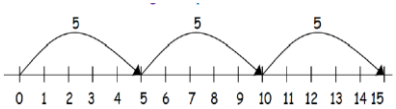
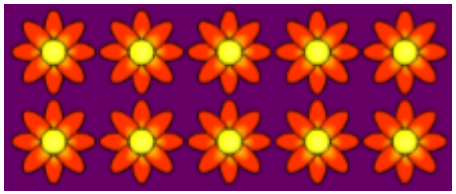
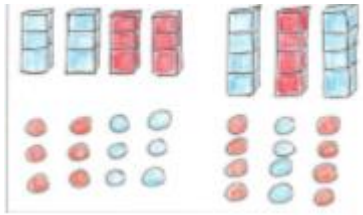
Objective and Strategies	Concrete	Pictorial	Abstract
		Subtraction - Year 2	
Regroup a ten into ten ones	Use a PV chart to show how to change a ten into ten ones 		20—4 = 16 Use knowledge of number bonds to 10 16 + 4 = 20
Make ten strategy	Use a bead bar or bead strings to get the biggest number. Then start at the smaller number and model counting to next ten and the rest. 34—28 	Use a number line to count on to next ten and then the rest. 	93—76 = 17 76 + 4 = 80 80 + 10 = 90 90 + 3 = 93
Partitioning to subtract without regrouping	34—13 = 21    Use Dienes to show how to partition the number when subtracting without regrouping.	Children to draw represenations of deines  43—21 = 22	43—21 = 22

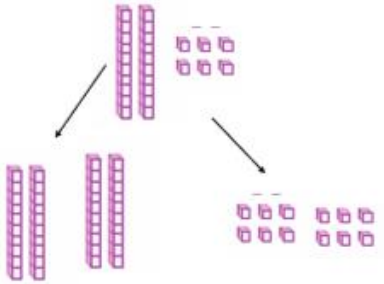
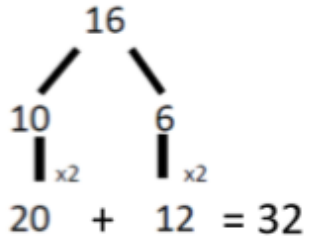
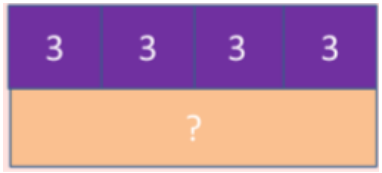
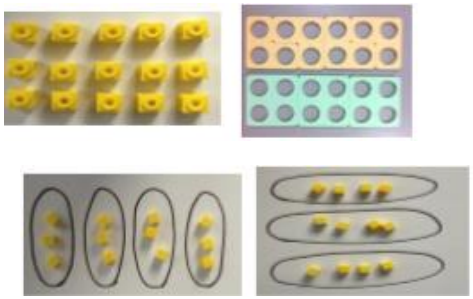
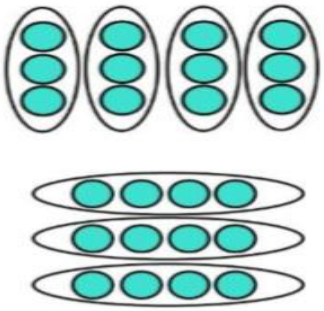
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Subtraction - Year 3</u>			
Column method without regrouping		Draw represenations to help to show working. 	
Column method with regrouping	Exchange one ten for ten ones to subtract  	. 	

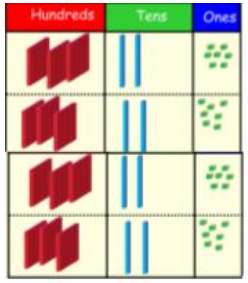
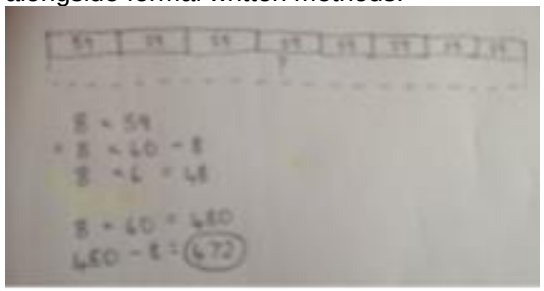
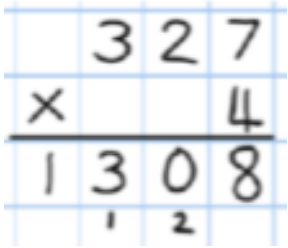
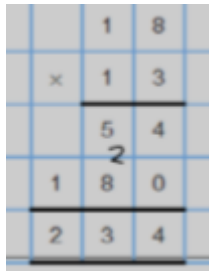
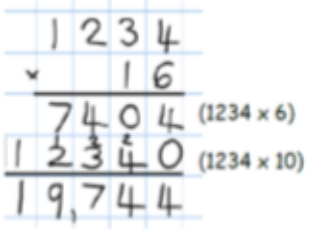
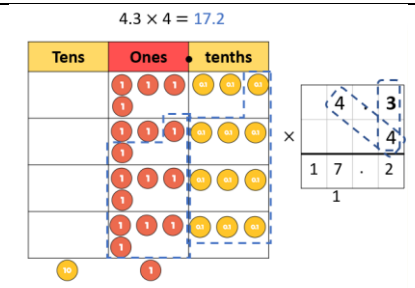
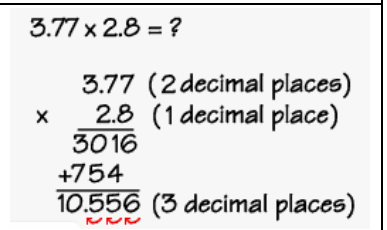
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Subtraction- Year 4,5 & 6</u>			
Year 4 Subtract with up to 4-digits			
Year 5 Subtract with at least 4-digits, including money and measures	 Use of Base 10 or other manipulatives to support learning of subtraction	3,402 – 1,309 = Th H T O 3 4 0 2 – 1 3 0 9 3,402 – 1,309 = 2,093 Th H T O 3 4 9 12 – 1 3 0 9 2 0 9 3 Show representations for exchanges using place value charts. For example, 1 ten exchanges for 10 ones.	 Use zeros for place-holders. 

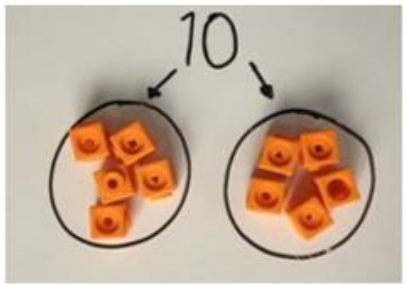
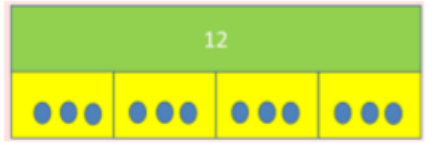
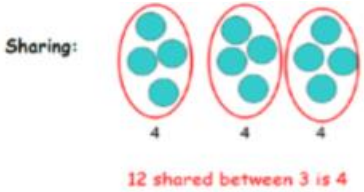
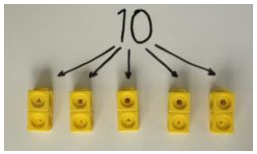
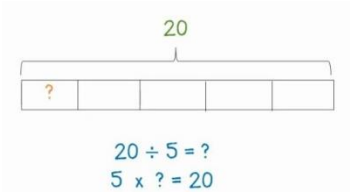
Year 6 Subtract with increasingly large and more complex numbers and decimal values.			

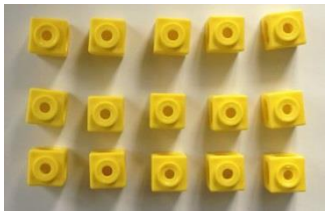
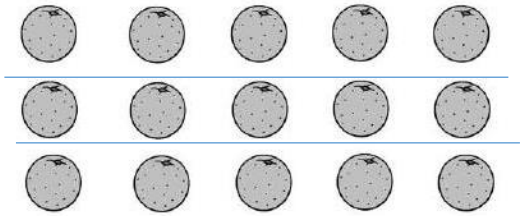
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Multiplication - Year 1</u>			
Doubling	Use practical activities to show how to double a number.  double 4 is 8 4 × 2 = 8	Double 4 is 8  Draw pictures to show how to double a number.	Double 4 is 8
Counting in multiples	  Count in multiples supported by concrete objects in equal groups.	 Use a number line or pictures to continue support in counting in multiples.	Count in multiples of a number aloud. Write sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25 , 30

Repeated addition	   Use different objects to add equal groups.	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	Write addition sentences to describe objects and pictures. 
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc. 	Draw arrays 	3 x 2 = 6 2 x 5 = 10

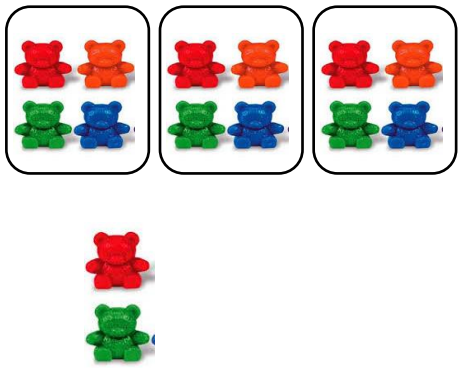
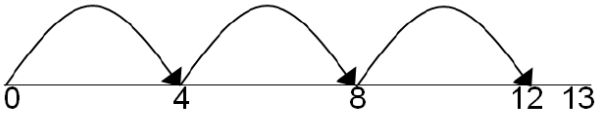
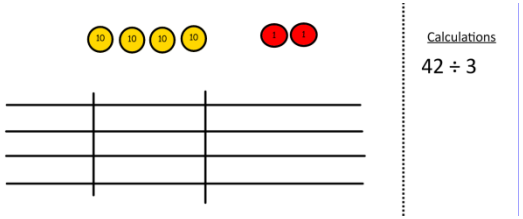
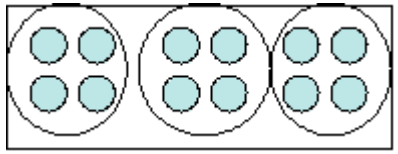
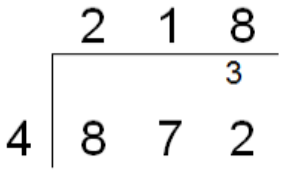
Objective and Strategies	Concrete	Pictorial	Abstract
<u>Multiplication - Year 2</u>			
Doubling		Draw pictures and representations.	Partition a number and then double each part before recombining it back together 
Counting in multiples of 2, 3, 4, 5, 10 from 0	 4 x 3 =  8 x 5 =	 6 x 5 = 4 x 3 = 	Count in multiples of a number aloud. Write sequences with multiples of numbers. 0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25, 30
Multiplication is commutative			12 = 3 × 4 12 = 4 × 3

Objective and Strategies	Concrete	Pictorial	Abstract
Multiplication - Year 3 & 4			
Column Method Multiply by a 1-digit number	327 x 4 	Bar modelling and number lines support learners when solving problems with multiplication alongside formal written methods.  Use 'multiple by multiples of 10' and adjust.	
Multiplication - Year 5 & 6			
Column Method Multiply by a 2-digit number			  Record the 0 as a place holder
Year 6 Multiplying decimals			Mutipy the numbers removing the decimal place. Then put the decimal point back in,  ensuring that the amount of digits after the decimal point is the same as in the question.

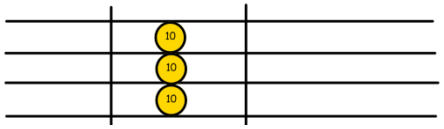
Objective and Strategies	Concrete	Pictorial	Abstract
		Division - Year 1	
Sharing objects into groups	 	Children use pictures or shapes to share quantities. 8 ÷ 2 = 4 	12 shared between 3 is 4
		Division - Year 2	
Division as sharing		 12 ÷ 4 = 3 	12 ÷ 3= 4
Division as grouping	 10 ÷ 2 = Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.	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. 	28 ÷ 7 = 4 Divide 28 into 7 groups. How many are in each group?

Division within 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. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7

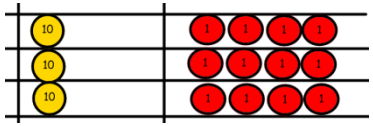
Division - Year 3

Objective and Strategies	Concrete	Pictorial	Abstract
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. 13 ÷ 4 =   Draw dots and group them to divide an amount and clearly show a remainder. 14 ÷ 3 =	Complete written divisions and show the remainder using r. e.g. 29 ÷ 8 = 3 r5 
Short division with no remainders	Use place value counters to divide using the bus stop method alongside  42 ÷ 3= Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left	Children can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.  Encourage them to move towards counting in multiples to divide more efficiently.	Begin with divisions that divide equally with no remainder. Start with the digit with the largest place value. Carry over what you can't divide e.g. the 3 tens. 

over.

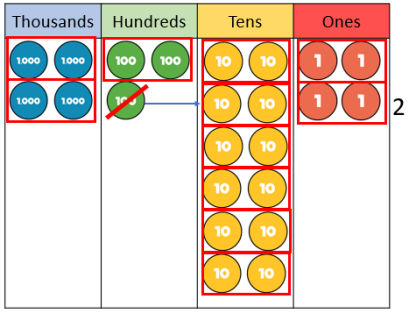


We exchange this ten for ten ones and then share the ones equally among the groups.



We count how much is in 1 group. The answer is 14.

4,324 ÷ 2

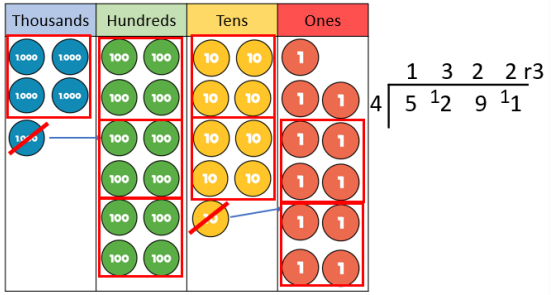


$$2\overline{)4\ 3^{1}2\ 4}$$ = 2 1 6 2

Division- Year 4 & 5

Short division with remainders

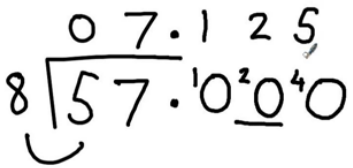
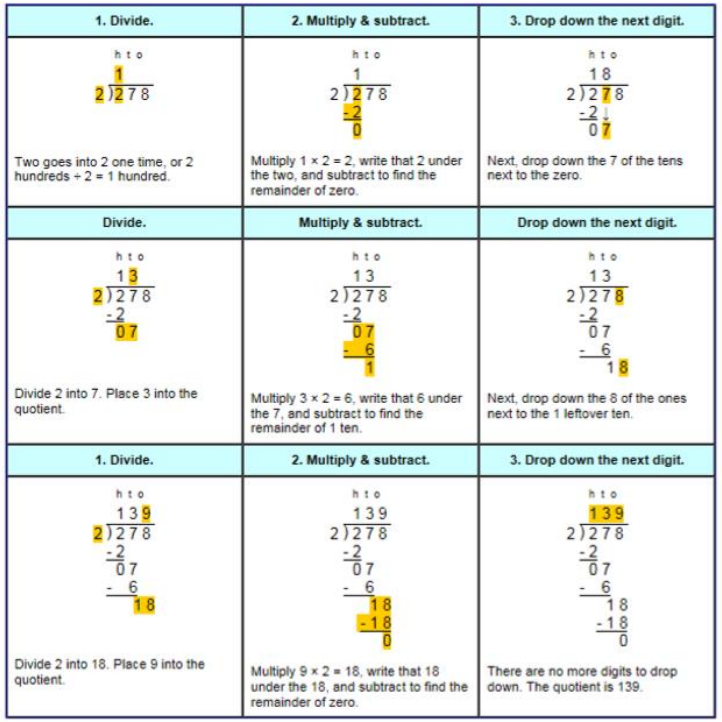
5,291 ÷ 4 = 1,322 r3



$$4\overline{)5\ ^{1}2\ 9\ ^{1}1}$$ = 1 3 2 2 r3

$$5\overline{)4\ 3\ 2}$$ = 8 6 r 2 (3)

Complete written divisions and show the remainder using r.

Objective and Strategies	Concrete	Pictorial	Abstract
<u>Division - Year 6</u>			
Short Division Leaving your answer as a decimal			Move onto divisions with a remainder. Once children understand remainders, begin to express as a fraction or decimal. 
Long Division		Children will use long division to divide numbers with up to 4-digits by 2-digit numbers.