Wansdyke Primary School

Futura Learning Partnership

Mathematics at Wansdyke Primary School

Status	Date
Teaching Staff	September 2022
AGC Governors	September 2022
Revision due	September 2023

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Vision

"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**

At Wansdyke Primary School, we believe that every child can achieve a mastery of number which allows them to be curious and confident mathematicians who embrace challenge. Children will ask questions and think creatively, applying mathematical reasoning to enable them to find out more about the world. In maths lessons, children will feel a sense of accomplishment and joy as they successfully solve problems and apply their mathematical understanding practically, preparing them for the use of maths in daily life.

Curriculum Intent

We aim for all pupils to:

- become **fluent** in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- be able to **solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios
- **reason mathematically** by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.

This will be underpinned by			
Mastery approach	High expectations	Modelling	Making links
We teach using a mastery approach; we take small steps in our learning and present problems in a variety of ways to ensure that every child can secure, deep and adaptable understanding of maths.	Every child is expected to make progress from their starting point and will succeed. We believe all children can achieve with the correct support.	Teachers will demonstrate the learning process to pupils highlighting key procedures. We aim to make implicit decision making explicit. This will be accompanied by scaffolds where appropriate.	Every child will make links and notice patterns in their maths. This will allow children to commit knowledge and understanding to their long-term memory.
Teaching fluency	Teaching of reasoning	Teaching of problem solving	A vocabulary-rich learning environment
We aim for all of our children to become fluent in mathematics fundamentals. This will be achieved through varied, frequent practice with problems which in increase in complexity over time, so children develop conceptual understanding, rapid recall and the ability to apply this knowledge.	Our children will reason mathematically by developing skills, which allow them to follow a logical line of enquiry, develop an argument, justification or proof using mathematical language or representations.	All pupils will 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.	We will create a learning environment which is rich in mathematical vocabulary. This will support children to explain their thinking, improve their oral reasoning and in turn their written response. **Please see the glossary of vocabulary used at the end of this document.**

Implementation

Mathematics at Wansdyke is taught with the overarching belief that all children can be successful. Lessons are structured to follow our *five principles of effective teaching* which are detailed in our T&L policy. Mathematics lessons are taught for approximately one hour each morning, as well as four Mastering Number (EY&KS1)/Number fluency (KS2) lessons for approximately 15 minutes in the afternoons. We believe in a *'keep up not catch up'* approach to learning; assessment is used throughout the lesson to provide meaningful feedback and tailor support based on the needs of the children.

Lesson structure

Retrieval or reteach

- An opportunity to check children have learned the material you want them to know. Teacher should plan activities such as quizzing or weekly/monthly review to provide children the opportunity to revisit previously learnt knowledge. This will improve confidence and fluency allowing children to commit the information to their long-term memory.

Present new material

- A method of explaining new information which deliberately links where possible to prior knowledge. Teachers will present information using a variety of representations and will encompass the **C**oncrete, **P**ictorial and **A**bstract approach. Teachers should model regularly to ensure implicit decision making is made explicit. This will serve as a scaffold for children to base their work on.

Hinge point

- Teacher will check for understanding using a variety of approaches. This will inform a decision to move children on to independent practice or to reteach the new material.

Independent practice

- Providing children with the time to develop the automaticity required for fluent application and recall. Children should move away from guided practice (as relevant for each child) and practice their learning independently. During this time, the teacher will work with a focus group which may have been identified by the hinge point.

Final check

- Teachers will evaluate the success of children's independent practice, providing feedback where needed. This final check will inform adaptations to planning, intervention and post learning feedback.

Teaching for Mastery Toolkit

We follow the National Curriculum for Mathematics and use the White Rose scheme of learning to support this. We adapt our lessons to suit our learners and ensure learning progresses in small steps. We follow guidance from NCETM and the Boolean Maths Hub, and draw upon a range of resources to support teaching and learning. These include:

- White Rose Maths (individual teacher logins)
- Deepening Understanding (individual teacher logins)
- Classroom Secrets (individual teacher logins)
- I See Reasoning (saved in Schemes of Work on the T-drive)
- NCETM Ready-to-progress (saved in Schemes of Work on the T-drive or available here)
- NCETM Curriculum Prioritisation materials (available here)

Intervention

Research shows that the most impactful intervention happens during the lesson within which a misconception or difficulty has arisen. When gaps are identified that may require further intervention, children may be supported within a small group during assembly or at another suitable point in the class' timetable.

We use the NCETM Ready-to-progress materials to help children to review, practise and consolidate learning. The resources are intended to enable children to be 'ready to progress' to their current year group's curriculum and so Year 1 materials will be used for a Year 2 group, Year 2 for a Year 3 group etc.

Impact

By the end of KS2 we aim for children to be **fluent** in the fundamentals of mathematics with a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They should have the skills to **solve problems** by applying their mathematics to a variety of situations with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios. Children will be able to **reason mathematically** by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.

This will be visible through:

- Evidence in knowledge
    - Children know how and why maths is used
    - They use mathematical language to describe their understanding
    - Children demonstrate a quick recall of facts and procedures
- Evidence in skills
    - Children independently select appropriate methods to approach problems
    - They demonstrate resilience when met with challenge
    - Children recognise relationships and make connections
- Outcomes
    - Teacher judgements on attainment within the National Curriculum
    - KS1/KS2 SATs
    - NFER assessments and optional SATs papers for Years 2 and 6 in terms 2, 4 and 6
    - Times Table assessments and Times Table Rockstars (TTRS)
- Pupil Voice
    - Children talk enthusiastically about maths lessons
    - They can articulate the context in which maths is being taught and relate this to real life purposes
    - Children show confidence and belief in their ability to learn and apply their mathematical understanding

Impact will be continuously monitored by class teachers, the maths lead and members of senior leadership through book-looks, learning walks, data monitoring and pupil conferencing.

Calculation Policy

The purpose of this policy is to clearly demonstrate how we teach the methods for calculation using the four operations (addition, subtraction, multiplication and division) at Wansdyke Primary School. It does not include teaching methods for other areas of mathematics or the resources that may be used to support these.

It has been designed to ensure there is clear progression for each operation in order to provide a smooth transition from one year group to the next. The policy is organised by year group and includes an overview of the mental and written strategies required to meet the expected standard for each year.

At Wansdyke Primary School we teach maths using the CPA (Concrete, Pictorial and Abstract) approach. This means that we use maths manipulatives, pictorial representations and abstract recordings to represent mathematical concepts and problems. These are used in conjunction with one another and not necessarily in sequential order.

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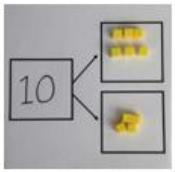
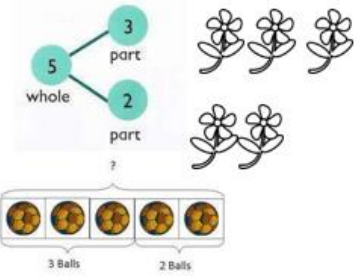
Year One - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Number bonds of 5, 6, 7, 8, 9 and 10	  Use cubes to add two numbers together as a group or in a bar. 	 Use pictures to add two numbers together as a group or in a bar. 	4 + 2 = 6 2 + 4 = 6 6 = 4 + 2 6 = 2 + 4 Use missing number questions to support fluency.
Counting	 Start with the larger number on a bead string and count on to the smaller number		4 + 3 = 7 Place the larger number in your head and count on the smaller number to find your answer.

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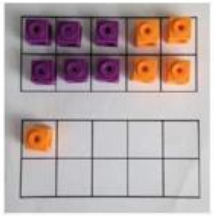
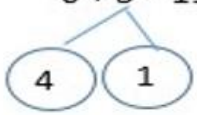
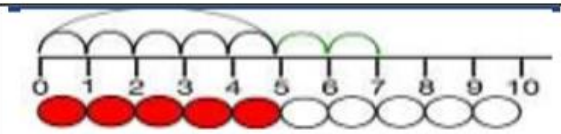
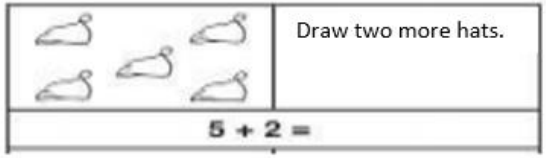
Year One - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Regrouping to make 10	  6 + 5 = 11 Using coloured cubes to represent this.	 6 + 5 = 11  6 + 4 =10 10 + 1 = 11	6 + 5 = 11
Represent and use number bonds and related subtraction facts	 2 more than 5	  	Include missing number questions: 8 = ? + 3 5 + ? = 8 Place an emphasis on language *1 more than 5 is equal to 6* *2 more than five is 7* *8 is 3 more than 5*

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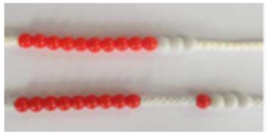
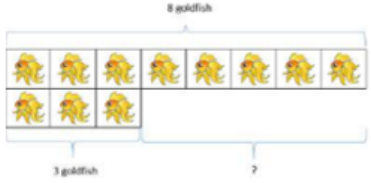
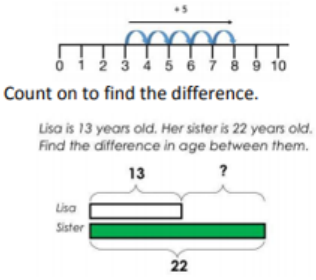
Year One - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Taking away ones	Use physical objects, counters, cubes etc. to show how objects can be taken away. 4 – 2 = 2 	Cross out drawn objects to show what has been taken away. 4 – 2 = 2 	4 – 2 = 2 Allow children to explore the question in a variety of ways and with missing numbers.
Counting back	Represent the larger number in your subtraction. Move the beads along as you count backwards in ones. 13 – 4 = 9 	Count back on a number line  Start at the greatest number and count back the smaller number, showing the jumps.	13 – 4 = 9 Encourage children to do this mentally. *Put 13 in your head and count back four. What number are you at?*
Finding the difference	Compare amounts and objects to find the difference. Physical bar models can be used. *Use cubes to build towers to find the difference* 	 Children should be supported to draw bars to find the difference	Hannah has 8 goldfish. Helen has 3 goldfish. Find the difference between the number of goldfish the girls have.

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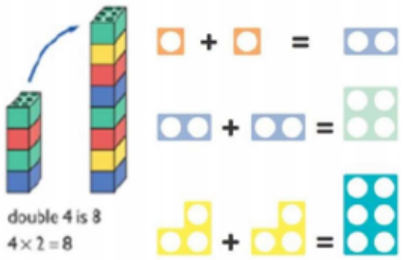
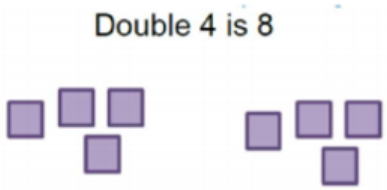
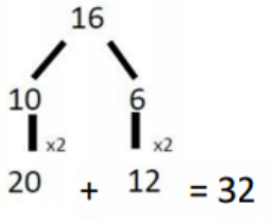
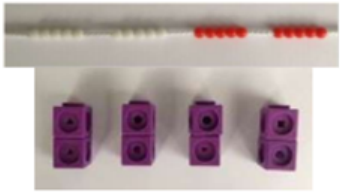
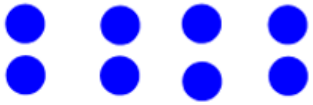
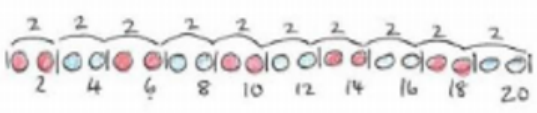
Year One - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Doubling	Use practical activities using manipulatives including cubes and Numicon. 	Draw pictures to represent doubling 	Partition a number, double each part before recombining it 
Counting in multiples (2s, 5s, 10s)	Use bead bars, counting sticks and other concrete recourses. Children count with you progressing to children counting in multiples as you say the group. 	 Children create representation to show 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

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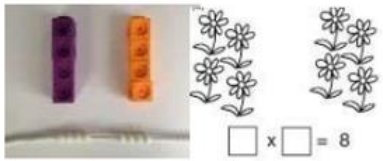
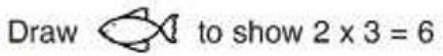
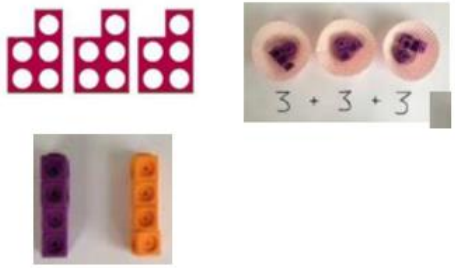
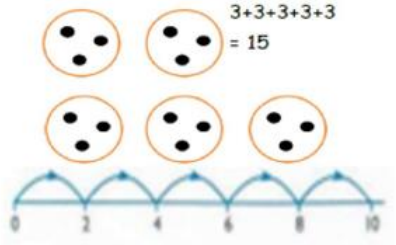
Year One - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Making equal groups (finding the total).	Use manipulatives to find equal groups 	Draw and make representations 	2 x 4 = 8 2 x 5 = 10 5 x 2 = 10
Repeated addition	Use different objects to add equal groups 	Use pictorial representations including number lines to solve problems. 	Write addition calculations to describe pictures/objects. 
Understanding arrays	Use objects laid out in arrays to find the answers to 2 lots of 5, 3 lots of 2 etc. 	Draw representations of arrays to show understanding. 	3 x 5 = 15 6 x 5 = 30

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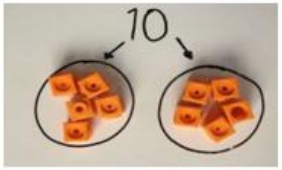
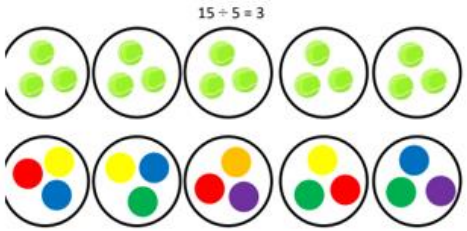
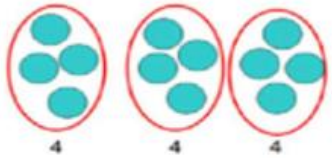
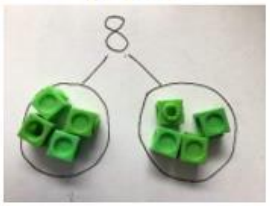
Year One - Division			
Objective/Strategy	Concrete	Pictorial	Abstract
Division as sharing	I have 10 cubes, can you share them equally into 2 groups?    	Use pictures of shapes to share quantities  8 ÷ 2 = 4  12 shared between 3 is 4 Children use bar modelling to show understanding and support thinking.  12 ÷ 4 = 3	Share 8 buns between 2 people 8 ÷ 2 = 4 

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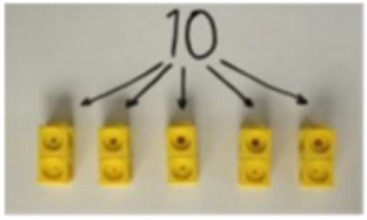
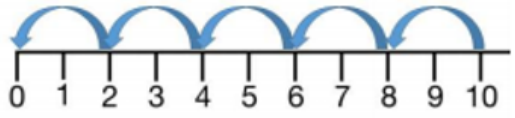
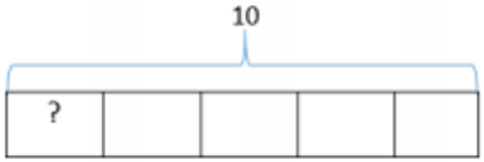
Year One - Division			
Objective/Strategy	Concrete	Pictorial	Abstract
Division as grouping	Divide quantities into equal groups. Use cubes, counters, objects and place value counters to support this. Divide quantities into equal groups. Use cubes, counters, objects or place value counters to aid understanding.  	Use a number line to show jumps in groups. Jumps = groups.  Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be in each group.  10 ÷ 5 = ? 5 x ? = 10	Divide 10 into 5 groups/ How many are in each group? 10 ÷ 5 = 2

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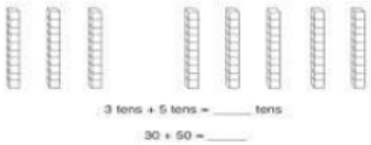
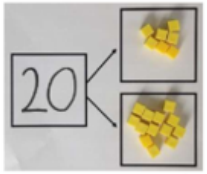
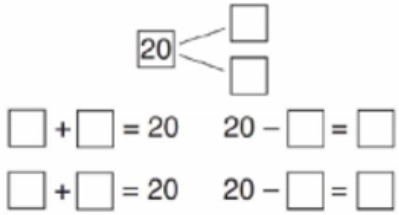
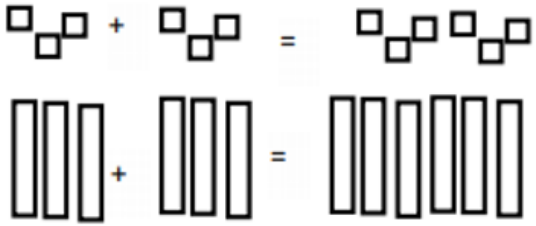
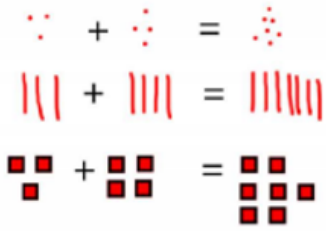
Year Two - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Adding multiples of 10	10, 20, 30, 40, 50  Model using dienes and bead strings.	 Use representations for base ten.	20 + 30 = 50 70 = 50 + 20 40 + = 60
Using known number facts *Part, part whole*	 Children explore ways of making numbers within 20.		Explore commutativity of addition by to build a fact family. Explore the inverse relationship of addition/subtractions and use this to check calculations. 
Using known facts		Children should draw representations of H, T and O 	5 + 2 = 7 Leads to 50 + 20 = 70 Leads to 500 + 200 = 700

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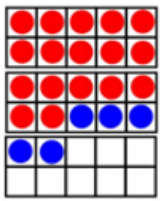
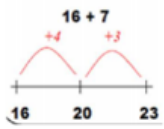
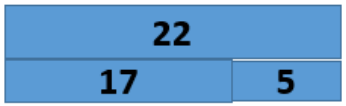
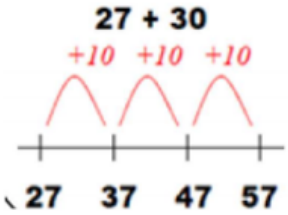
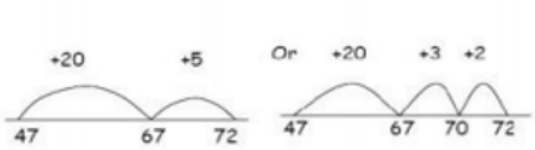
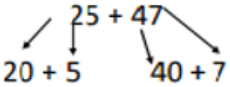
Year Two - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Adding a 2 digit number and ones	 17 + 5 = 22 Use ten frames to make another ten. Explore the pattern further 17 + 5 = 22 27 + 5 = 32	Use part part whole 17 + 5 = 22 17 + 3 = 20 + 2 = 22  Or number line to count on using partitioning	Explore related facts 17 + 5 = 22 5 = 17 = 22 22 – 17 = 5 22 – 5 = 17 Record as digits and in a bar model  *Lead into a column format to reinforce place value*
Adding a 2 digit number and tens	25 + 10 =  Children explore how the ones digit does not change.	Use a number line. *Reinforce with counting* 	27 + 10 = 37 27 + 20 = 47 27 + = 57 Exploration of the inverse and use of missing boxes is crucial.
Adding two 2 digit numbers	 Model using dienes, place value counters and numicon	 Use number line and bridge ten using partitioning if needed.	 20 + 40 = 60 5+ 7 =12 60 + 12 = 72

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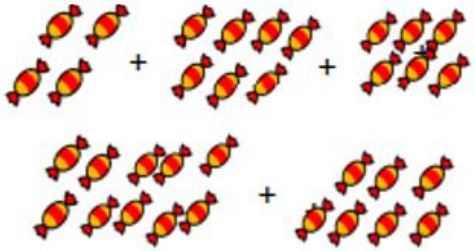
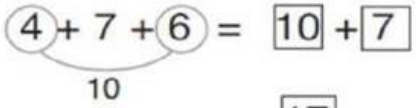
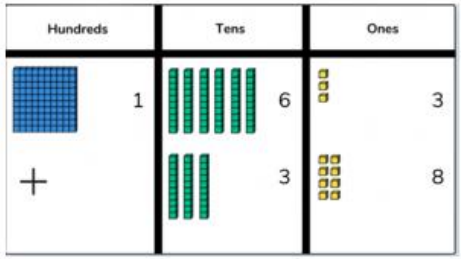
Year Two - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Adding 3 single digit numbers	4 + 7 + 6 = 17 Children recognise 4 + 6 together =10. Add on 7.  Children should be encouraged to look for links between numbers using a range of concrete manipulatives.	 Add together three groups of objects. Draw a picture to recombine the groups to make 10.	 Combine the two numbers which equal 10 and add on the remainder.
Column method (When regrouping, children should physical regroup the manipulatives and record the digits).	 Children can use a range of manipulatives but we should encourage the recording of digits alongside this to support the creation of links	 Children can use pictorial representations of manipulatives such as dines and place value counters.	34 + 15 = 49 34 + 15 49

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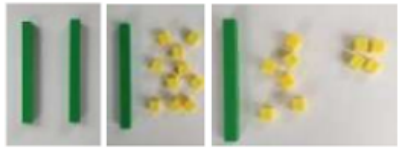
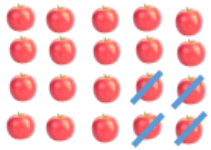
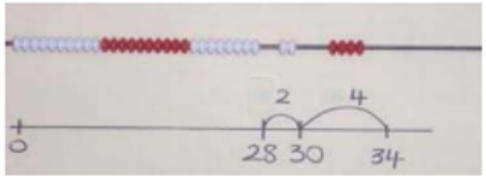
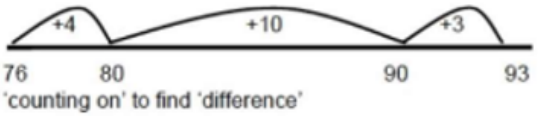
Year Two - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Regrouping 10	 Model how 10 can be changed into 10 ones – support using a place value chart.	20 – 4 = 	20 - 4 = 16 Children should be encouraged to apply know number facts 10 – 4 = 6 20 – 4 = 16 etc.
Partitioning to subtract	34 – 13 = 21 Use manipulatives such as dienes to physically take tens/ones away. 	Children draw their own representations and cross them off.  43—21 = 22	43 – 21 = 22
Subtracting whilst bridging 10/100	Use a bead bar/string to model counting to the next ten and so on 	 'counting on' to find 'difference' Use a number line to count to the next ten and so on.	93 – 76 = 17

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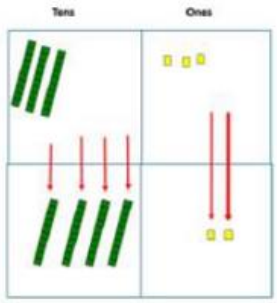
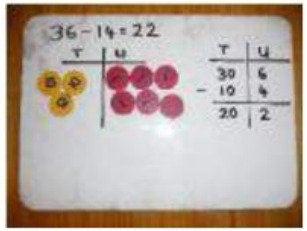
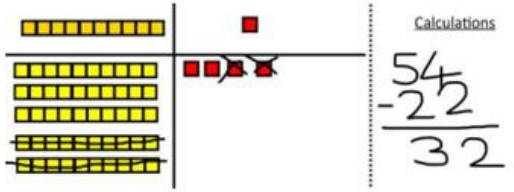
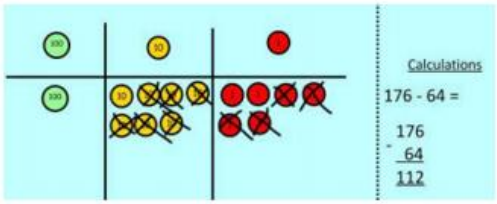
Year Two - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Column Method without regrouping	75 – 42 = 33  Use Base 10 to make the bigger number then take the smaller number away. Show how you partition numbers to subtract. Again make the larger number first.  	 Draw the Base 10 or place value counters alongside the written calculation to help to show working.  	47 – 24 = 23 40 + 7 – 20 + 4 20 + 3 This will lead to a clear written column subtraction. 

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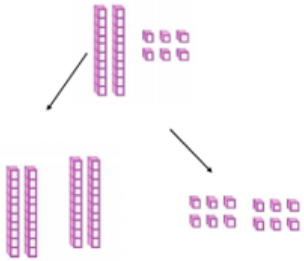
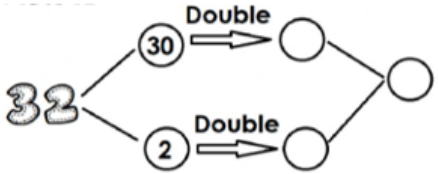
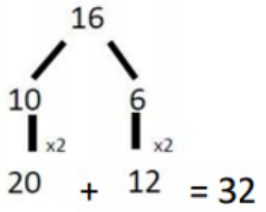
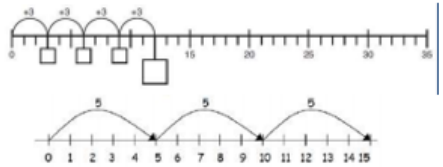
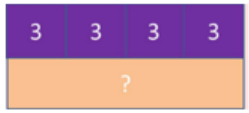
Year Two - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Doubling	Model doubling using dienes and place value counters.  40 + 12 = 52	Draw pictures and representations to show how to double numbers. 	Partition a number then double each part before recombining it. 
Counting in multiples of 2, 3, 4, 5 and 10 from 0 (Repeated addition).	Count the groups as children count in multiples. Progress language use to *lots of*. **Use bar models.**   5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40 	Number lines, counting sticks and bar models should be used to represent this.  5 + 5 + 5 = 15 	Count in multiples of a given number aloud Write sequences of multiples 0, 2, 4, 6, 8, 10, 12 0, 3, 6, 9, 12, 15, 18 0, 5, 10, 15, 20, 25, 30, 35 3 x 4 = ___

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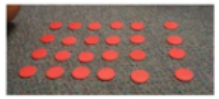
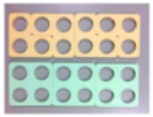
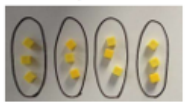
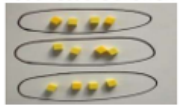
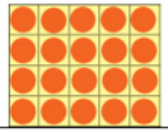
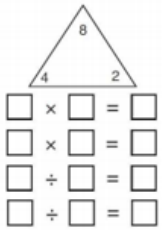
Year Two - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Multiplication is commutative	Create arrays using counters and cubes and Numicon.    Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.  	Use representations of arrays to show different calculations and explore commutativity.  4 × 2 = 8 2 × 4 = 8  2 × 4 = 8 4 × 2 = 8 ink arrays to area of rectangles. 	12 = 3 x 4 12 = 4 x 3 Use an array to write multiplication sentences and reinforce repeated addition.  5 + 5 + 5 = 15 3 + 3 + 3 + 3 + 3 = 15 5 x 3 = 15 3 x 5 = 15
Using the inverse *To be taught alongside division. This relationship is crucial.*		Use representations both printed and drawn. 	2 x 4 = 8 8 = 2 x 4 4 x 2 = 8 8 = 4 x 2 8 ÷ 2 = 4 2 = 8 ÷ 4 8 ÷ 4 = 2 4 = 8÷ 2

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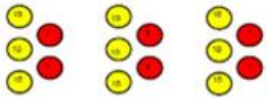
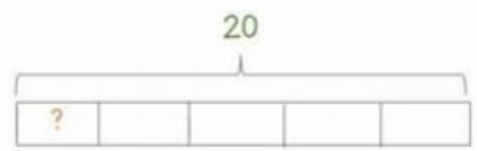
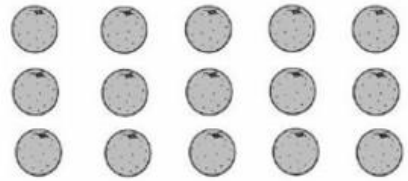
Year Two - Division			
Objective/Strategy	Concrete	Pictorial	Abstract
Division as grouping	Use cubes, counters, Numicon and other manipulatives to support understanding. 24 divided into groups of 6 = 4  96 ÷ 3 = 32 	Use bar modelling to support solving division problems.  20 ÷ 5 = ? 5 x ? = 20	How many groups of 6 are in 24? 24 ÷ 6 = 4
Division with arrays	Link division to multiplication by creating an array and thinking about the calculations (number sentences) that can be created.  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 eight linking number sentences. 7 x 4 = 28 4 x 7 = 28 28 ÷ 7 = 4 28 ÷ 4 = 7 28 = 7 x 4 28 = 4 x 7 4 = 28 ÷ 7 7 = 28 ÷ 4

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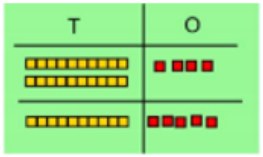
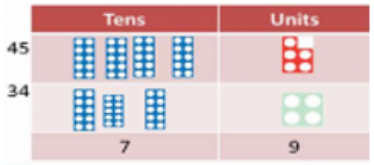
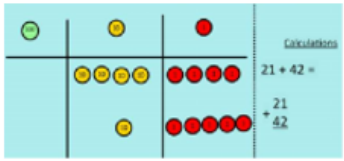
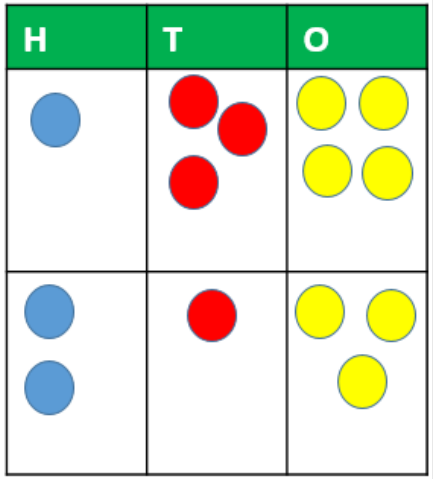
Year Three - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Add and subtract numbers with up to 3 digits. *Column method without regrouping*	Make use of manipulatives (dines, Numicon, place value counters) to represent the calculation. Children taught to add the ones first, tens then hundreds.    	Children should be able to draw their own representations to support their thinking. Model drawing your own hundreds, tens and ones frame. 134 +213  	134 +213 743

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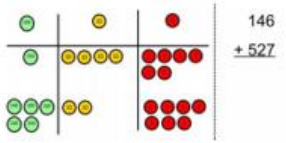
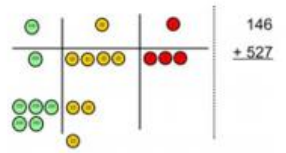
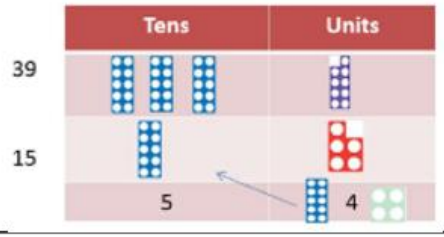
Year Three - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Add and subtract numbers with up to 3 digits. *Column method with regrouping*	Make both number on a place value grid.  Add the ones and exchange 10 ones for 1 ten.  *Repeat for exchanging tens for hundreds etc.* Numicon can also be used to represent this.  	Children can draw a pictorial representation of the columns and place value counters to support their understanding.  	100 + 40 + 6 500 + 20 + 7 600 + 70 + 3 = 673 As children progress move from expanded to compact method. 146 + 527 673 1

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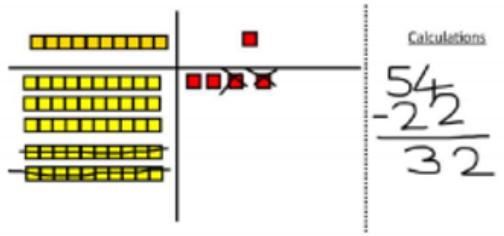
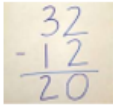
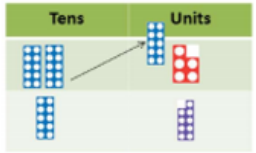
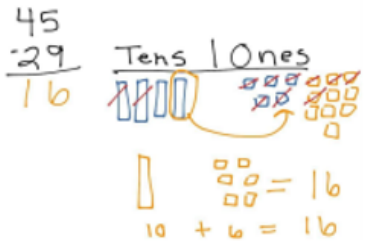
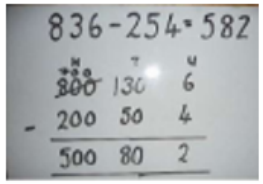
Year Three - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Column subtraction without regrouping.	  47—32 Use base 10/Numicon to represent this – include digits.		47 – 24 = 23 40 + 7 – 20 + 4 20 + 3 
Column subtraction with regrouping.	Begin with base 10 or Numicon. Model exchanging a ten for ten ones etc. Place value counters could also be used. 	Children can draw base ten or place value counters and cross off. 	 Use partitioning in place value columns.  Move to the formal written method when appropriate.

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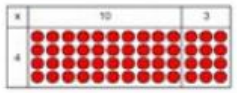
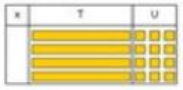
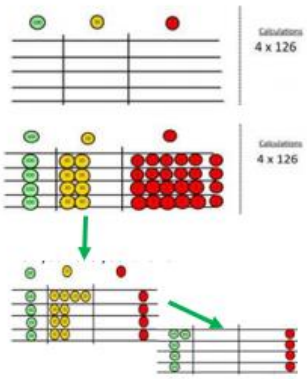
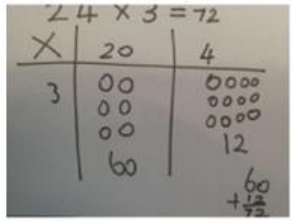
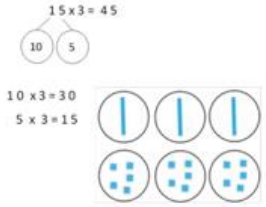
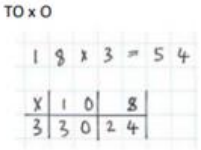
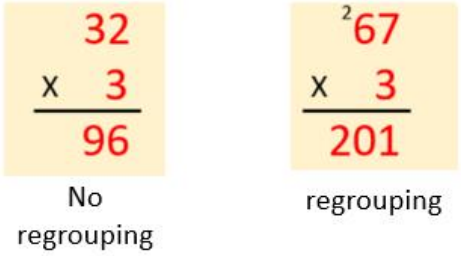
Year Three - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Multiply 2 digit numbers by 1 digit numbers. *Grid method, progressing to the formal written method.*	Show links with arrays to introduce the grid method.  4 rows of 10 4 rows of 3 Progress to base ten for a more compact method.  4 rows of 13 Move to place value counters to represent finding groups of a number. We need four rows as we are multiplying by 4.  Fill each row with 126. Add up each column, starting with the ones making any exchanges needed Then you have your answer.	Children can represent their work with place value counters in a way that they understand. They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.  Use base ten to explore multiplication – link to written digits and partitioning. 	Begin with multiplying by one digit and displaying the addition alongside the grid.  210 + 35 = 245  Move to a formal written method.  No regrouping regrouping

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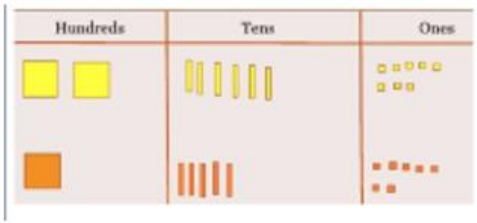
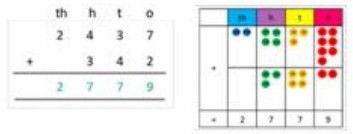
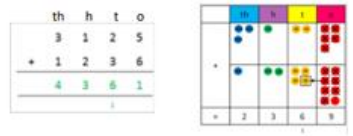
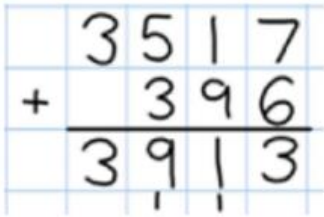
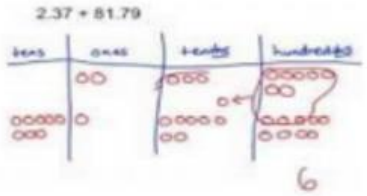
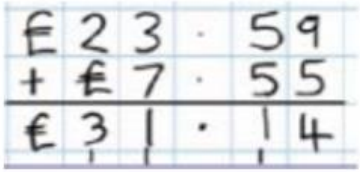
Year Four - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Add numbers with up to 4 digits. *Formal written method.*	Children should use manipulatives to add and exchange. The calculation should be displayed alongside the manipulatives. 	Without exchanging  With exchanging 	 Relate to contexts of money and measure.
Add decimals with 2 decimal places, including money.	 Introduce decimal place value counters and model exchanging.		 As children progress, introduce numbers with the same decimal places and different. Money should be used here.

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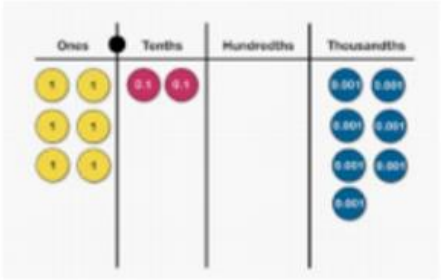
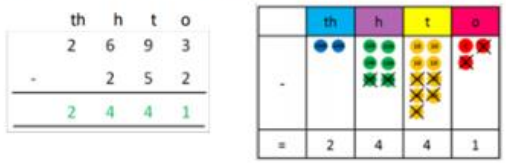
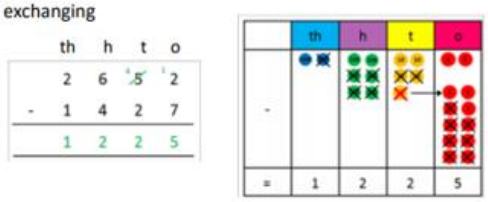
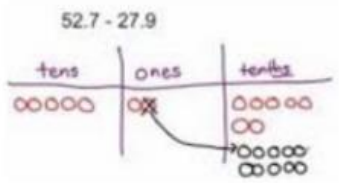
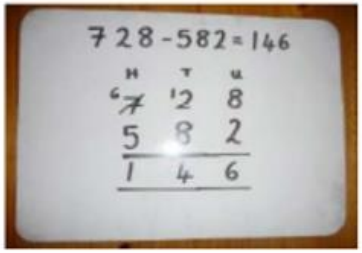
Year Four - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Subtract numbers up to 4 digits using a formal written method. *Decimal subtraction should be introduced through the context of money.*	Children should use place value counters to represent numbers. Children should understand the concept of exchanging. 	Without exchanging (crossing out)  With exchanging  Display digits alongside pictorial representations to support transition to abstract. 	

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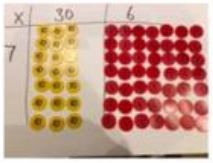
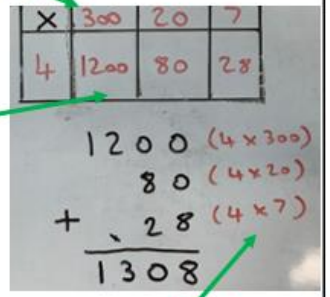
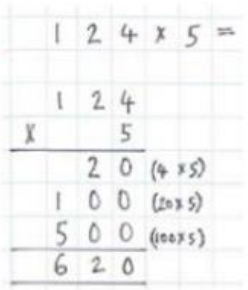
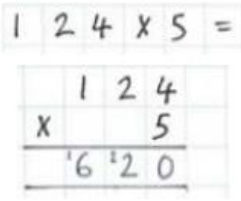
Year Four - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Multiply 2/3 digit numbers by a 1 digit number using a formal written method. *Column multiplication.*	Revision of grid method can be helpful with transition.  As children progress, introduce the formal written method first as **expanded form** then moving to the **compact form**.	<table><tr><td>×</td><td>300</td><td>20</td><td>7</td></tr><tr><td>4</td><td>1200</td><td>80</td><td>28</td></tr></table> Relate the grid method to the expanded form through bar modelling. Support with place value counters in place of/alongside digits. 1) Partition numbers  2) Complete calculation 3) Find the sum- display expanded form	  Progress to a formal written method using expanded form to support. Move onto a compact formal written method.

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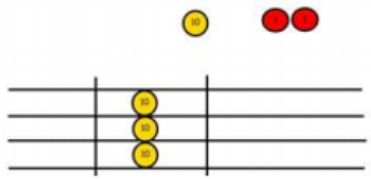
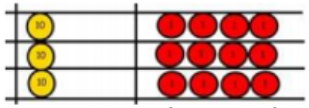
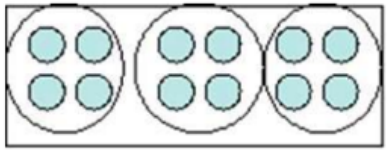
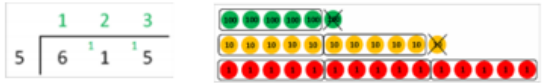
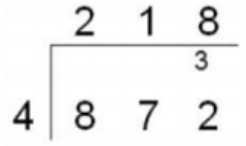
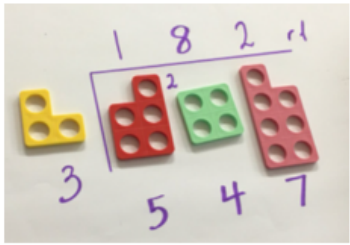
Year Four - Division			
Objective/Strategy	Concrete	Pictorial	Abstract
Short division	Use place value counters to divide using the bus stop method alongside. 42 ÷ 3= Start with the largest place value. We are sharing 40 into 3 groups. We can place 1 ten in each group with 1 ten left over.  We exchange this ten for ten ones. Share the ones equally among the groups.  We can now see each group has 14.	Children can use drawn pictures with dots/circles to help divide equally. *Children should be encouraged to count in multiples to make division more efficient.*  *Without regrouping*  *With regrouping*  *Note children can be exposed to remainders but it is not a teaching point until year 5.*	Begin with divisions that divide equally with no remainder.  We use the language of *"How many groups of 4 are in 8?"*  Numicon can also be used to support the teaching of short division.

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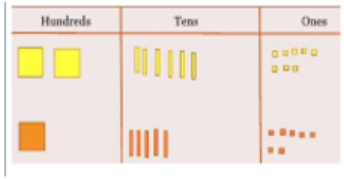
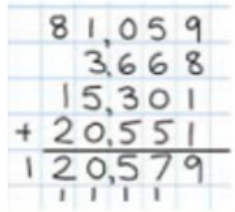
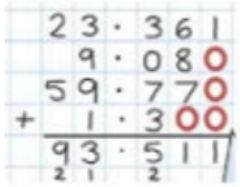
Year Five - Addition			
Objective/Strategy	Concrete	Pictorial	Abstract
Add numbers with more than 4 digits	  Children should use manipulatives to add and exchange. The calculation should be displayed alongside the manipulatives.	 Children can use place value counters alongside written calculation to support progression to a formal written method..	Compact column addition to add numbers with up to 5 digits. 5 2 8 9 4 + 3 9 5 1 5 9 2 4 0 9 Compact column addition to add decimal numbers. t o ths hths 5 2 • 1 5 + 2 9 • 5 7 8 1 • 7 2
Add numbers with increasing complexity including adding money, measure and decimals with different numbers of decimal points	As above	As above	 Insert zeros as place holders. Explain this concept. 

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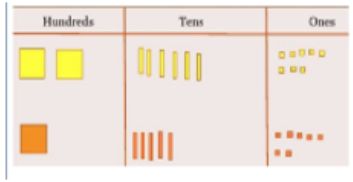
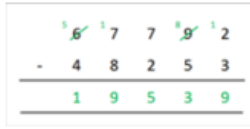
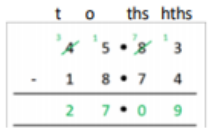
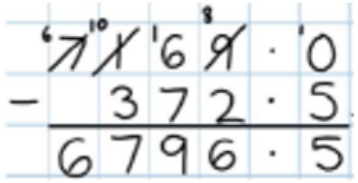
Year Five - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Subtract with at least 4 digits, including money and measures. *Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal*	Children encouraged to use manipulatives to support where necessary. Use of place value counters.  	When understood children can find their own method of recording and representing the exchanging or regrouping. 	Compact column subtraction to subtract numbers with up to 5 digits.  Compact column subtraction to subtract decimal numbers.  *Use manipulative alongside or expanded form to scaffold for children.* 

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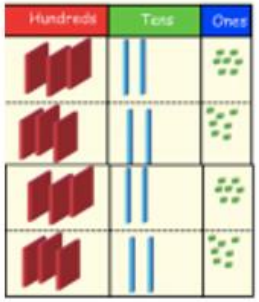
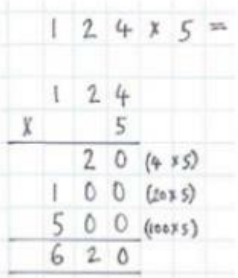
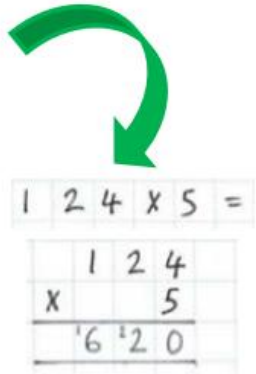
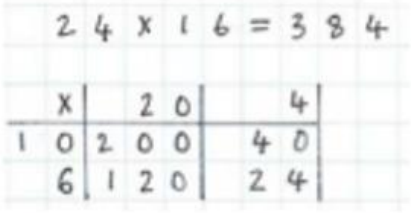
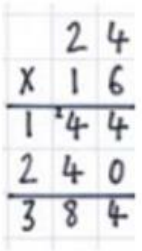
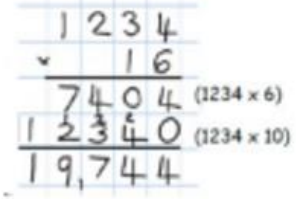
Year Five - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Multiply numbers up to 4-digits by a one-digit number using the format written method	Children can still be supported using manipulatives such as numicon and place value counters. Children may need to start with no regrouping. 	Use place value counters (and grid) alongside written calculation.	 
Multiplying up to 4 digit numbers by 2 digits.	As above	Use the grid method to partition the various parts of the calculation. 	 24 x 6 on the first row. (6 x 4 = 24, carrying the 2 for the 20, then 6 x 2) 24 x 10 on the second row. Show multiplying by 10 by putting zero in the ones first 

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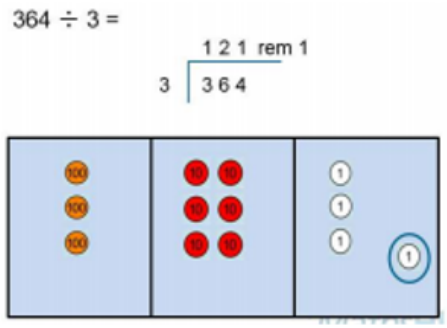
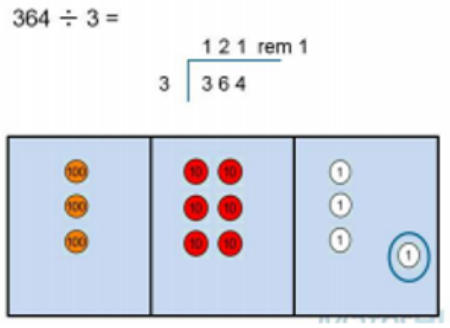
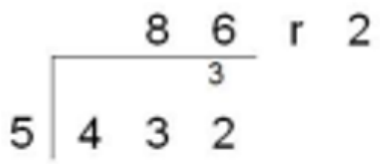
Year Five - Division			
Objective/Strategy	Concrete	Pictorial	Abstract
Divide at least 4 digit numbers by 1 digit. Interpret remainders appropriately for the context. *Short Division*	Children should use counters and other physical manipulatives alongside written calculation. 	 	 Children should be using the language of *how many groups of 5 are in 4.* The use of pictorial before abstract is crucial.

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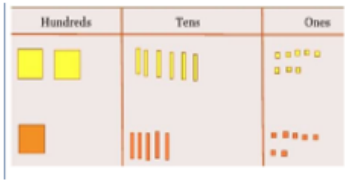
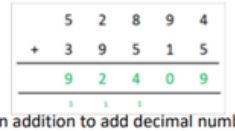
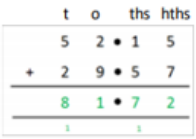
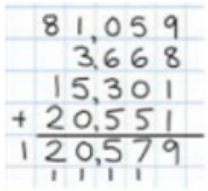
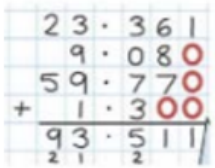
Year Six - Addition

Objective/Strategy	Concrete	Pictorial	Abstract
Add numbers with increasing complexity including adding money, measure and decimals with different numbers of decimal points	  Children should use manipulatives to add and exchange. The calculation should be displayed alongside the manipulatives.	 Children can use place value counters alongside written calculation to support progression to a formal written method..	Compact column addition to add numbers with up to 5 digits.  Compact column addition to add decimal numbers.   Insert zeros as place holders.  Explain this concept.

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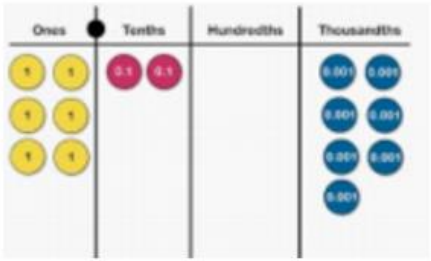
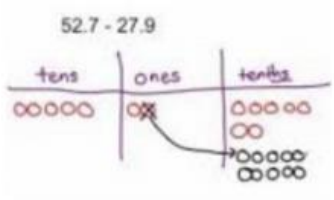
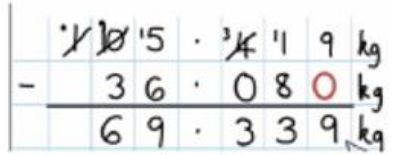
Year Six - Subtraction			
Objective/Strategy	Concrete	Pictorial	Abstract
Subtract with increasingly large and more complex numbers and decimal values (up to 3 decimal places)	Children encouraged to use manipulatives to support where necessary. Use of place value counters. 	When understood children can find their own method of recording and representing the exchanging or regrouping. 	Column subtraction to subtract numbers with up to 6 digits.  Compact column subtraction to subtract decimal numbers with up to 2 places.  *Use manipulative alongside or expanded form to scaffold for children.* 

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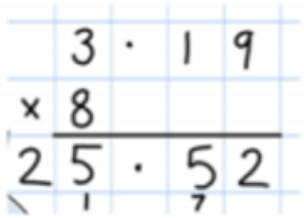
Year Six - Multiplication			
Objective/Strategy	Concrete	Pictorial	Abstract
Multiply decimal numbers up to 2 decimal places by a single digit	Children can still be supported using manipulatives such as numicon and place value counters. Children may need to start with no regrouping.	Use place value counters (and grid) alongside written calculation.	 Emphasis on place value and correct recording of the formal method.

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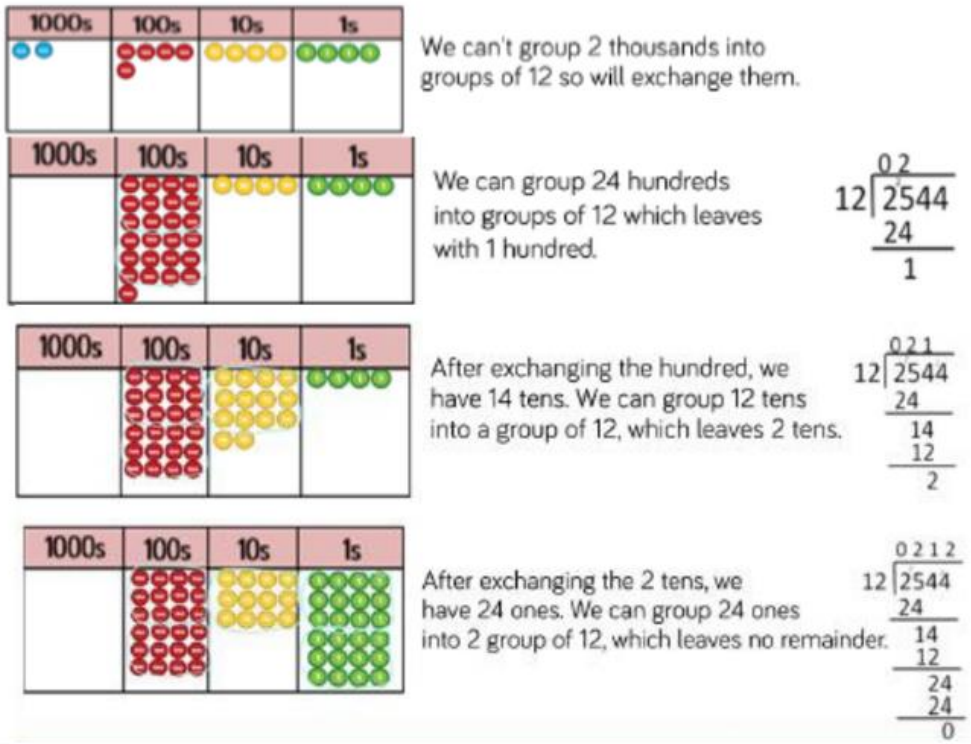
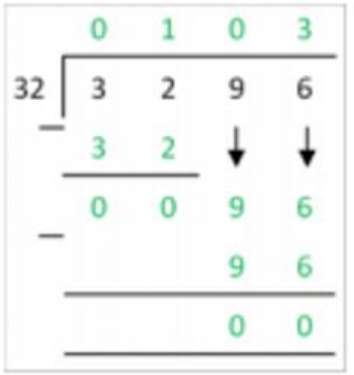
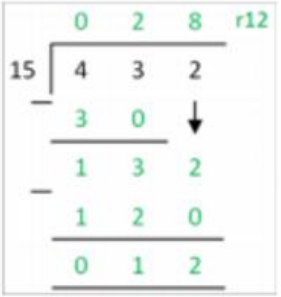
Year Six - Division

Objective/Strategy	Concrete	Pictorial	Abstract
Long division	Long division using place value counters 2544 ÷ 12		







(the remainder can be interpreted as $\frac{12}{15} \rightarrow \frac{4}{5}$ *or 0.8)*

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Number Fluency and Times Tables

Number sense is an important concept that separates surface level understanding from mastery. When working with numbers, children need to be both procedurally and conceptually fluent so that they can be accurate, efficient and flexible when solving problems. We want to ensure that all children at Wansdyke are able to think flexibly and apply their understanding to different areas of mathematics. Each week, all children will have four 15 minute number fluency or times table lessons.

We will be taking part in the National Centre for Excellence in the Teaching of Mathematics' (NCETM) *Mastering Number* programme, which uses an abacus-like rekenrek to help children in Reception and KS1, to develop confidence and fluency with number.

In KS2, our number fluency lessons focus predominantly on times tables. When teaching times tables, we focus on one times table per term and encourage children to make connections between different calculations, for example if 2 x 7 = 14, then the product of 4 x 7 must be double 14 as 4 is double 2. We will also encourage children to make links using place value and inverse operations such as 3 x 8 = 24, therefore 30 x 8 = 240 and 240 ÷ 8 = 3.

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Number Fluency Whole School Schedule

Term	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
1&2	1+1 2+2 (Including related subtraction facts)	4+2 5+2 6+2 7+2 9+2 4+3 5+3 6+3 (Including related subtraction facts) **+ Counting in 5s**	5+4 5+6 6+7 8+7 8+9 (Including related subtraction facts) **+ 5 x table** (Including related division facts)	4 x table 8 x table (Including related division facts) **+ Counting in 100s**	12 x table (Including related division facts) **+ Counting in 25s**	4 x table 8 x table (Exploring connections between multiplication facts, place value and inverse operations)	Short multiplication/ Division Convert between improper fractions and mixed numbers
3&4	3+3 4+4 5+5 (Including halving facts) 2+1 2+3 (Including related subtraction facts)	6+6 7+7 8+8 9+9 (Including halving facts) **+ Counting in 2s**	5+7 5+8 5+9 6+8 6+9 7+9 (Including related subtraction facts) **+ 2 x table** (Including related division facts)	6 x table 9 x table (Including related division facts) **+ Counting in 50s**	Revision **+ Counting in 1000s**	7 x table 11 x table (Exploring connections between multiplication facts, place value and inverse operations)	Multiplying and dividing fractions by integers Convert between fractions, decimals and percentages
5&6	1+9 2+8 3+7 4+6 5+5 (Including related subtraction facts) **+ Counting in10s**	3+8 3+9 4+7 4+8 4+9 **+ 10 x table** (Including related division facts)	Counting in 3s **+ 3 x table** (Including related division facts)	7 x table 11 x table (Including related division facts)	Revision + Testing MTC	6 x table 9 x table 12 x table (Exploring connections between multiplication facts, place value and inverse operations)	Consolidation and revision

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Assessment, Marking and Feedback

All children will receive feedback and support to progress their learning. We believe that the most impactful feedback is given at the time of working so that the learner may adapt their process. After lessons, books will be marked to assess whether each child has met, or exceeded the learning objective, by following the school's marking policy. Through this assessment, the teacher will identify those who may need further support or challenge.

In terms 2 (**not for Year 1**), 4 and 6, children in Years 1-6 will take a summative assessment, this will be a SATs paper in Years 2 and 6, or an NFER paper in non-SATs year groups. Scores on these assessments are used to highlight areas in which we can further support children and are used to inform the teacher's assessment and planning in order to do so.

Insight tracking is used to record predicted attainment targets three times a year. This will be recorded as follows.

Futura	Wansdyke	Prediction	Presently
3	3	Will be working in **'Greater depth'** at the end of the year.	Requires further challenge within the curriculum.
2	2a	Will be **securely** working **at** the standard at the end of the year.	Keeping pace with the curriculum.
	2b	Will **just** be working **at** the standard at the end of the year.	Just keeping pace with the curriculum.
1	1a	Will be working **below** the standard at the end of the year.	Not keeping pace with the curriculum and working with some of last year's curriculum.
	1b	Will be working **significantly below** the standard at the end of the year.	Mainly working within the curriculum from the previous year.

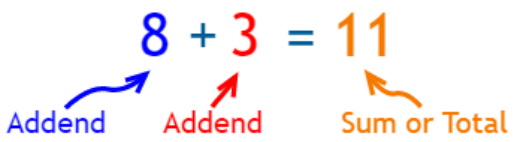
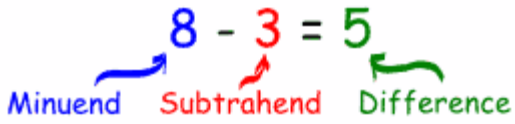
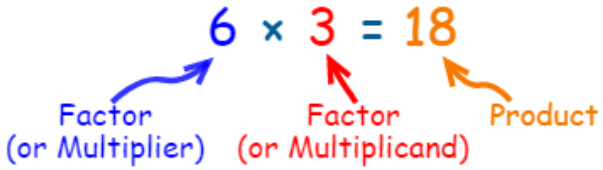
Learning Environment

Add photos of expectations of working wall and vocabulary displayed.

Adapt working wall to include what is being covered in number fluency sessions.

Mathematical Vocabulary

This vocabulary will be used in maths lessons across the whole school when teaching the relevant areas of mathematics.

Addition	addend sum total	
Subtraction	minuend subtrahend difference	
Multiplication	factor multiplier multiplicand product	
Division	dividend divisor quotient	

Vocabulary for each year group?

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