2 Maths Curriculum Intent, Implementation and Impact

Strategic intent

To **develop a curriculum which** develops lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future.

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

- **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.

Children deserve:

- To be set appropriate learning challenges
- To be taught well and be given the opportunity to learn in ways that maximise the chances of success.
- To have adults working with them to tackle the specific barriers to progress they face.

Implementation

Content and Sequence

Long-term planning is deliberately spaced and includes opportunities to consolidate and rehearse for revision and over-learning of the content.

We believe mastery is achieved over time and through practice; this is reflected in the design of our maths curriculum.

Within each aspect, children have the opportunity to acquire/refine, practise/apply, and extend/deepen their learning. Each level of challenge builds on prior learning and extends thinking. Component steps are intentionally planned so learning is cumulative, to give all children the opportunity for deliberate practice and the tools to reach a greater depth standard when appropriate. Maths learning is built using the Concrete, Pictorial and Abstract approach to learning, where children visually grasp the mathematical concepts covered prior to applying this to abstract learning.

Teaching and Learning, Assessment and Feedback

Starting points are identified through accurate teacher assessment and/or prior learning. End points are taken as age related expectations at the end of each National Curriculum year.

The intended learning is always the focus of actions in the classroom. Activities and resources are carefully chosen and deliberately designed to focus effort towards practising the learning intentions.

Target books are used to personalise individual steps for learning.

Feedback is given is response to timely and continuous formative assessment in every lesson. Teachers use a range of formative assessment tools, including questions and observations to gauge children's level of understanding and knowledge. This is used to either offer support and scaffolds, or to give opportunities for greater challenge to deepen learning. Feedback is given in line with our feedback policy, including Green Pen Work to check, consolidate or challenge.

Starter and plenary activities allow children to become secure within their knowledge and skills. These are useful assessment opportunities: feedback is given to groups or the whole class as identified. Activities are used to revise previous content and address misconceptions as identified through observing children's work and responses.

Impact

2017				2018				2019			
KS1		KS2		KS1		KS2		KS1		KS2	
		Progress 2				Progress 0.2				Progress -1.2	
EXS (%)	GSD (%)	EXS (%)	GSD (%)	EXS (%)	GSD (%)	EXS (%)	GSD (%)	EXS (%)	GSD (%)	EXS (%)	GSD (%)
84	21	85	20	81	19	80	25	83	28	81	29

No ceiling is placed on any learner: teaching groups are flexible and adapted according to emerging learning needs and the level of support that is needed to enable all children to access the right curriculum content for their learning. Children speak positively about the ability to drive their learning through self-assessment and the opportunities they have for extra practice time or additional challenge that the learning journey affords them.

Nearly all children leave Hanging Heaton CE (VC) J&I School having achieved at least the expected standard and as confident mathematicians, ready to take on the next stage in their education. High numbers achieve a greater depth within the standard.

SEND children make at least expected progress and reach their attainment targets.

Disadvantaged children make progress that is in line with their peers.

Children leave Hanging Heaton VC (CE) J&I School as confident, capable mathematicians and with a positive attitude towards maths.

The first few years of a child's life are especially important for mathematics development. Research shows that early mathematical knowledge predicts later reading ability and general education and social progress. Conversely, children who start behind in mathematics tend to stay behind throughout their whole educational journey.

The objective for those working in Early Years, then, is to ensure that all children develop firm mathematical foundations in a way that is engaging, and appropriate for their age. The materials here are primarily designed to support Reception teachers (those working with 4-5 year olds), and are based on international research.

The materials are organised into key concepts (not individual objectives), which underpin many early mathematics curricula. The typical progression highlights the range of experiences (some of which may be appropriate for younger children) but the activities and opportunities could be developed across the Reception provision.

There are six key areas of early mathematics learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond.

- **Cardinality and Counting:** Understanding that the cardinal value of a number refers to the quantity, or 'howmanyness' of things it represents
- **Comparison:** Understanding that comparing numbers involves knowing which numbers are worth more or less than each other
- **Composition:** Understanding that one number can be made up from (composed from) two or more smaller numbers
- **Pattern:** Looking for and finding patterns helps children notice and understand mathematical relationships
- **Shape and Space:** Understanding what happens when shapes move, or combine with other shapes, helps develop wider mathematical thinking
- **Measure:** Comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later.

Maths Early Years Progression Charts – Cardinality and Counting

The cardinal value of a number refers to the quantity of things it represents, e.g. the numerosity, 'howmanyness', or 'threeness' of three. When children understand the cardinality of numbers, they know what the numbers mean in terms of knowing how many things they refer to. Counting is one way of establishing how many things are in a group, because the last number you say tells you how many there are. Children enjoy learning the sequence of counting numbers long before they understand the cardinal values of the numbers. Subitising is another way of recognising how many there are, without counting.

Counting: saying number words in sequence	Practical examples
Children need to know number names, initially to five, then ten, and extending to larger numbers, including crossing boundaries 19/20 and 29/30. Counting back is a useful skill, but young children will find this harder because of the demand it places on working memory.	counting backwards, for example number rhymes starting from different numbers.
Counting: tagging each object with one number word	Practical examples
Children need lots of opportunities to count things in irregular arrangements. For example, how many play	counting things of different sizes – this helps children to focus on the numerosity of the count

people are in the sandpit? How many cars have we got in the garage? These opportunities can also include counting things that cannot be seen, touched or moved.	counting things that can't be seen, such as sounds, actions, words and counting things that cannot be moved, such as pictures on a screen, birds at the bird table, etc.
Counting: knowing the last number counted gives the total so far	**Practical examples**
Children need the opportunity to count out or 'give' a number of things from a larger group, not just to count the number that are there. This is to support them in focusing on the 'stopping number' which gives the cardinal value.	playing dice games to collect a number of things playing track games and counting along the track.
Subitising: recognising small quantities without needing to count them all	**Practical examples**
Subitising is recognising how many things are in a group without having to count them one by one. Children need opportunities to see regular arrangements of small quantities, e.g. a dice face, structured manipulatives, etc., and be encouraged to say the quantity shown. Children also need opportunities to recognise small amounts (up to five) when they are not in the 'regular' arrangement, e.g. small handfuls of objects.	using dot cards, dominoes and dice as part of a game, including irregularly arranged dots (e.g. stuck on) playing hidden object games where objects are revealed for a few seconds; for example, small toys hidden under bowl – shuffle them, lift the bowl briefly and ask how many there were 'all at once fingers' – show me four fingers.
Numeral meanings	**Practical examples**
Children need to have the opportunity to match a number symbol with a number of things. Look for opportunities to have a range of number symbols available, e.g. wooden numerals, calculators, handwritten (include different examples of a number)	using numeral dice in games; matching numerals with varied groups of things using 'tidy-up labels' on containers and checking that nothing is missing reading number books • putting the right number of snacks on a tray for the number of children shown on a card.
Conservation: knowing that the number does not change if things are rearranged (as long as none have been added or taken away)	**Practical examples**
Children need the opportunity to recognise amounts that have been rearranged and to generalise that, if nothing has been added or taken away, then the amount is the same.	correcting a puppet who may say that there are more or fewer objects now, as they have been moved around, e.g. spread out or pushed together • contexts such as sharing things out (grouping them in different ways) and then the puppet complaining that it is not fair as they have less • encouraging the children to make different patterns with a given number of things.

Common errors in this area may include: • missing out an object or counting an object twice • when asked how many cars are in a group of four, simply recounting '1, 2, 3, 4,' without concluding that 'there are four cars in the group' • when asked to 'get five oranges' from a tray, a child just grabs some, or carries on counting past five • when objects in a group are rearranged, the child (unnecessarily) recounts them to find how many there are • difficulties in counting back • confusion over the 'teen' numbers – they are hard to learn • missing a number like 15 (13 or 15 are commonly missed out) or confusing 'thirteen' and 'thirty'.	**What to look for can a child:** • consistently recite the correct sequence of numbers and cross decade boundaries? • collect nine from a large pile, e.g. nine pencils from a pot? • subitise (instantly recognise) a group that contains up to four, then five, in a range of ways, e.g. fingers, dice, random arrangement? • select a numeral to represent a quantity in a range of fonts, e.g. , , ? • correct a puppet who thinks the amount has changed when their collection has been rearranged?

Maths Early Years Progression Charts – Comparison

Comparing numbers involves knowing which numbers are worth more or less than each other. This depends both on understanding cardinal values of numbers and also knowing that the later counting numbers are worth more (because the next number is always one more). This understanding underpins the mental number line which children will develop later, which represents the relative value of numbers.

More than/less than	Practical examples
Children need progressive experiences where they can compare collections and begin to talk about which group has more things. Initially, the groups need to be very obviously different, with one group having a widely different number of things. Collections should also offer challenges, such as including more small things and fewer large things, to draw attention to the numerosity of the comparison, i.e. the number of things, not the size of them.	collections for children to sort and compare, which include objects which are identical, and which include objects of different kinds or sizes collections with a large number of things, and collections with a small number of things.

Identifying groups with the same number of things	Practical examples
Children need the opportunity to see that groups could consist of equal numbers of things. Children can check that groups are equal, by matching objects on a one-to one basis.	ensuring that when providing groups to compare, there are some that have an equal amount asking children to convert two unequal groups into two that have the same number, e.g. 'There are 6 apples in one bag and 2 in another bag; can we make the bags equal for the 2 hungry horses?'

Comparing numbers and reasoning	Practical examples
Children need opportunities to apply their understanding by comparing actual numbers and explaining which is more. For example, a child is shown two boxes and told one has 5 sweets in and the other has 3 sweets in. Which box would they pick to keep and why? Look for the reasoning in the response they give, i.e. 'I would pick the 5 box because 5 is more than 3 and I want more.' If shown two numerals, children can say which is larger by counting or matching one-to-one. Children can compare numbers that are far apart, near to and next to each other. For example, 8 is a lot bigger than 2 but 3 is only a little bit bigger than 2.	explaining unfair sharing - 'This one has more because it has 5 and that one only has 3' comparing numbers that are far apart, near to, and next to each other.

Knowing the 'one more than/one less than' relationship	Practical examples
Children need opportunities to see and begin to generalise the 'one more than/one less than' relationship between sequential numbers. They can apply this understanding by recognising when the quantity does not match the number, i.e. if a pack is labelled as 5 but contains only 4, the children can identify that this is not right. Support children in recognising that if they add one, they will get the next number, or if one is taken away, they will have the previous number. For example: 'There are 4 frogs on the log, 1 frog jumps off. How many will be left? How do you know?' •	labelling groups with the correct numeral. Do children spot the error if a group is mislabelled? For example, 'The label on the pot says 4 and we have 5 – what do we need to do?' A child may say, 'We need to take one out because we have one too many.' ensuring children focus on the numerosity of the group by having items in the collection of different kinds and sizes • making predictions about what the outcome will be in stories, rhymes and songs if one is added to, or if one is taken away

| Common errors in this area may include: • children not comparing the numerosity of the group and considering more in terms of size • children giving a response that does not match the context when estimating a number; e.g. when adding, giving as an answer a number that is smaller than the numbers given. | What to look for can a child: • state which group of objects has more? Can they do this with a large or small visual difference? • compare two numbers and say which is the larger? • predict how many there will be if you add or take away one? |

Maths Early Years Progression Charts – Composition

Knowing numbers are made up of two or more other smaller numbers involves 'part–whole' understanding. Learning to 'see' a whole number and its parts at the same time is a key development in children's number understanding. Partitioning numbers into other numbers and putting them back together again underpins understanding of addition and subtraction as inverse operations.

Part–whole: identifying smaller numbers within a number (conceptual subitising – seeing groups and combining to a total)	Practical examples
Children need opportunities to see small numbers within a larger collection. 'Number talks' allow children to discuss what they see. For instance, with giant ladybirds: 'There are 5 spots altogether. I can see 4 and 1, I can see 3 and 2, and I can see 1 and 1 and 1 and 1 and 1.' Encourage exploration of all the ways that 'five' can be and look. Children are encouraged to look closely at numbers to see what else they can see. This reinforces the concept of conservation.	encouraging making arrangements with (e.g.) ten; ensuring the children talk about the different arrangements they can see within the whole.
Inverse operations	**Practical examples**
Children need opportunities to partition a number of things into two groups, and to recognise that those groups can be recombined to make the same total. Encourage children to say the whole number.	exploring songs; for example, 'Five Currant Buns' – show that the whole is still five, but some are in the shop and some have been taken away; check throughout that there are still five currant buns playing skittles and looking at how many are standing. How many have fallen over? How many are there altogether?
A number can be partitioned into different pairs of number	**Practical examples**
Children need opportunities to explore a range of ways to partition a whole number. The emphasis here is on identifying the pairs of numbers that make a total. Children can do this in two ways – physically separating a group, or constructing a group from two kinds of things.	Numicon towers: layering up Numicon pieces of the same total putting things into two containers in different ways making a number with two different kinds of things. For example, make a fruit skewer with five pieces of fruit, using bowls of bananas/strawberries to choose from; then ask the children to describe how they have made theirs. They should compare it with a partner's: 'What is the same about your skewers? What is different?' Bunny Ears: using your fingers like bunny ears. 'With two hands, show me five fingers. Can you do it in a different way?' Or, 'Show five fingers altogether with a friend.' • Spill the Beans: using double-sided counters or beans, where one side is coloured, throw the collection and note how many of each type can be seen and how many altogether. using six bean bags with different fabric on each side, throw the collection and note how many of each type can be seen.
A number can be partitioned into more than two numbers	**Practical examples**
Children need opportunities to explore the different ways that numbers can be partitioned, i.e. into more than two groups. Situations to promote this include increasing the number of pots to put a given amount into, e.g. planting ten seeds into three/more pots.	role play, e.g. in a toy shop, ten toys need arranging onto the three shelves. How will you organise them? having more than two places to sort things into in any given context, e.g. arranging characters in small-world play in different locations games such as 'Posh Ducks' (Griffiths, R., Back, J. & Gifford, S. (2016) Making Numbers: Using manipulatives to teach arithmetic,

	OUP): using a set number of ducks, for example ten in three different locations (nest, water, decking), roll the dice and make one group match the amount shown without adding or taking any away.

Number bonds: knowing which pairs make a given number	**Practical examples**
Children need opportunities to say how many are hidden in a known number of things. For example: 'Five toys go into a tent, then two come out. How many are left in the tent?' The child should respond that there are still three toys in the tent.	playing hiding games with a number of objects in a box, under a cloth, in a tent, in a cave, etc. utilising classroom routines such as tidy-up time to identify how many are still missing from a pot with a number label.

Common errors in this area may include: • children suggesting that a larger number than the total are hidden.	**What to look for can a child:** • subitise small groups within a larger number? • make a reasonable guess at a hidden number? • in context, state two groups that make a larger amount? For example, how might the (six) bean bags land? You could have three with stripes up and three with spots up.

Maths Early Years Progression Charts – Pattern

Seeking and exploring patterns is at the heart of mathematics (Schoenfeld, 1992). Developing an awareness of pattern helps young children to notice and understand mathematical relationships. Clements and Sarama (2007) identify that patterns may provide the foundations of algebraic thinking, since they provide the opportunity for young children to observe and verbalise generalisations.

The focus in this section is on repeating patterns, progressing from children copying simple alternating AB patterns to identifying different structures in the 'unit of repeat', such as ABB or ABBC. Patterns can be made with objects like coloured cubes, small toys, buttons and keys, and with outdoor materials like pine cones, leaves or large blocks, as well as with movements and sounds, linking with music, dance, phonics and rhymes. Children can also spot and create patterns in a range of other contexts, such as printed patterns, timetables, numbers and stories

Continuing an AB pattern	**Practical examples**
Children need the opportunity to see a pattern, to talk about what they can see, and to continue a pattern. At first, they will do this one item at a time, e.g. red cube, blue cube, red cube…verbalising the pattern helps. Children may then be asked to say what they would add next to continue it.	building towers or trains of different-coloured cubes (continuing patterns horizontally and vertically) extending patterns using a wide range of identical objects in different colours, e.g. beads; small plastic toys such as bears, dinosaurs, vehicles. Try to avoid interlocking cubes or bead-threading so children can focus on the pattern rather than their coordination skills

Copying an AB pattern	**Practical examples**
Copying a pattern can be difficult for children if they have to keep comparing item by item. AB patterns are easiest – when presented to children, these should contain several repeats, to ensure that the pattern unit is evident. Discuss the nature of the pattern: how has the pattern been made? Patterns can have a range of features such as varying objects, size or orientation.	accessing a range of patterns to copy. For example, using the plastic bears: big, small, big, small, big… footwear: shoe, welly, shoe, welly…, actions and sounds: jump, twirl, jump, twirl, jump… or clap, stamp, clap, stamp collecting things in the outdoors environment: leaf, stick, leaf, stick…

Make their own AB pattern	Practical examples
As children progress from continuing to copying patterns, they can be challenged to change the sample pattern or to create their own. A range of objects can be provided for children to decide what the features of the pattern are going to be. Children may find it easier to make a pattern with the same colours as the original but with different objects. For example, copying a red–blue cube pattern with red and blue dinosaurs is easier than with yellow and green cubes. Patterns can involve different aspects and modes such as sounds, words or actions: some children will need suggestions, while others will think of their own. As children construct the patterns, ensure they have opportunities to: • repeat the unit at least three times (big bear, small bear; big bear, small bear; big bear, small bear). This is to ensure the child can sustain the pattern • make a specified pattern, e.g. 'Can you do a green, yellow pattern?' This is to ensure the child can apply their pattern understanding • choose their own rule, e.g. 'I am going to make a big, small pattern.' This is to ensure the child can identify pattern features/rules/criteria • choose their own actions or sounds, e.g. clap, stamp… This is to help children generalise the idea of pattern.	challenging the child to change one element of the pattern they have created, e.g. 'Can you change the red bear to a blue bear? What is the pattern now?' ensuring that there are numerous opportunities to create patterns – e.g. in the outdoors, using natural materials such as sticks, leaves, stones, pine cones; in craft activities, using stamping, sticking, printing; with musical instruments, using sounds such as drums, shakers, triangles, etc. working collaboratively with a friend to take turns to create a pattern, e.g. one claps, one stamps, or one gets the red bear, one gets the yellow bear, etc. challenging a friend to continue or copy their pattern
Spotting an error in an AB pattern	**Practical examples**
When working with AB patterns, children also need the opportunities to spot and correct errors. It is easiest to spot an extra item, then a missing item, then items swapped around. When presented with an AB pattern, children can be encouraged to describe it to make sure it is right. Then, to detect an error, they can track the pattern from the start. To begin with, children may know there is something wrong, but might not be able to say what the error is. They then might take several attempts to correct it, before being able to repair the error in one move.	presenting patterns with deliberate errors, including extra, missing and swapped items, e.g. red cube, blue cube, red cube, blue cube, red cube, red cube, blue cube – identifying there is an extra item and fixing it by removing the extra red cube, putting in an extra blue cube, or swapping the final cubes asking the children to make a pattern with a deliberate mistake and challenging a friend to spot it.
Identifying the unit of repeat	**Practical examples**
The key aspect of understanding patterns is identifying the smallest part of the pattern, or the 'unit of repeat' You can draw children's attention to this when building patterns by picking up a unit at a time, e.g. a blue block and a red block together, and describing this as a 'red blue pattern', rather than a red, blue, red, blue, red, blue pattern. Children can also be asked to show the pattern unit which repeats, e.g. show two blocks, a red and a blue	highlight within a pattern what the unit of repeat is and ask the children to describe it. At this point for pattern novices (children who aren't as experienced as others), it would be good to do this with physical objects so that the unit of repeat can be moved to show how it repeats. Patterns that are printed, stamped or stuck down, and therefore cannot be corrected, are more appropriate for more confident pattern makers
Continuing an ABC pattern	**Practical examples**
Once children are secure with alternating patterns, they can tackle more complex pattern structures: **ABC** has more items in the unit of repeat, but all different, e.g. red, blue, yellow; red, blue, yellow… **ABB** is more challenging because they have two items within the same unit of repeat, e.g. red, blue, blue; red, blue, blue…	building towers or trains of different-coloured cubes (continuing patterns horizontally and vertically) extending patterns using a wide range of identical objects in different colours, e.g. beads; small plastic toys such as bears, dinosaurs and vehicles.

ABBC is more complex because it is longer, with three items, but also includes items which are the same, e.g. red, blue, blue, yellow; red, blue, blue, yellow… **AABB** may be simpler as there are just two items, both repeated, e.g. red, red, blue, blue; red, red, blue, blue… Children who have only experienced alternating ABC patterns may state that patterns such as ABBC are not patterns, as you cannot have two of the same colour next to each other. This highlights that children need lots of experience of a range of pattern types, so early misconceptions do not form about what makes a pattern. When working on continuing these patterns, children should be encouraged to focus on the unit of repeat, e.g. 'I see you are making a red, blue, green pattern'. Ensure that children repeat the pattern at least three times and are encouraged to describe and say how they would continue.	Try to avoid using interlocking cubes or bead-threading, so children can focus on the pattern they are constructing rather than on their coordination skills.
Continuing a pattern which ends mid-unit	**Practical examples**
As children work on patterns involving more elements, they can be challenged to continue patterns which do not end after a whole unit of repeat. Provide experiences where the given pattern stops mid-unit.	providing a range of patterns – physical and on cards – that children can continue ensuring that the patterns offered have different structures and end after a complete or a partial unit.
Make their own ABB, ABBC patterns	**Practical examples**
As with the first stages of making an AB pattern, the same range of experiences needs to be provided when the unit of repeat extends. A range of objects can be provided for children to decide what the features of the pattern are going to be. Patterns may include varied items and modes, such as sounds and actions. Ensure that children have opportunities to: • repeat the unit at least three times (big bear, small bear, medium bear; big bear, small bear, medium bear; big bear, small bear, medium bear). This is to ensure the pattern can be sustained over a longer duration • make a specified pattern, e.g. 'Can you do a green, yellow, blue pattern?' This is to ensure the child can apply their pattern understanding • choose their own rule, e.g. 'I am going to make a big, small, small pattern.' This is to ensure the child can identify pattern features/rules/criteria • choose their own actions or sounds, e.g. clap, stamp, twirl… This is to support children in generalising pattern structures.	utilising a range of items in the environment to create patterns such as interlocking cubes and toys, e.g. links, elephants, camels exploring and creating patterns on peg boards, with fruit (e.g. fruit kebabs), musical instruments, movements and dance sequences
Spotting an error in an ABB pattern	**Practical examples**
When working with ABB patterns, children also need the opportunities to spot and correct errors. It is easiest to spot an extra item, then a missing item, then items swapped around. When presented with an ABB pattern, children can be encouraged to describe it to make sure it is right. Then, to detect an error, they can track the pattern from the start. To begin with, children may know there is something wrong, but might not be able to say what the error is. They then might take several attempts to correct it, before being able to repair the error in one move.	presenting patterns with deliberate errors once children have fixed the pattern, encouraging them to check the 'fix' by tracking the pattern asking the children to make a pattern with a deliberate mistake and challenging a friend to spot it.

Symbolising the unit structure	Practical examples
As children become more experienced with pattern continuing, -extending and -creating, encourage them to record the patterns that they make. Initially this might be straightforward representations, but over time these recordings may become more iconic, e.g. a red dot representing the red dinosaur, a squiggle or the letter R for red dinosaur. As this progresses, encourage the children to symbolise their patterns in a range of ways, and to use these symbols to continue the pattern to demonstrate their understanding of the pattern. Children may, with adult direction, pick up on the coding of patterns as AB, ABB, ABBC, etc. One additional level of challenge is to create symbols for movement/sound patterns, as the children need to construct a symbol with less concrete/visual support.	• including the following phrasing in discussion and dialogue: 'This is a red blue pattern; this/that; I call it an A (one of these) then a B (one of those).' • constructing patterns with actions and developing symbols to show the pattern and to provide 'instructions' for someone else to follow the pattern • inviting friends to copy the pattern from the symbols.
Generalising structures to another context or mode	**Practical examples**
As children gain experience of symbolising patterns, they develop their experience of pattern structure. As they identify the unit of repeat and express it, they will be able to use this knowledge to create a pattern in a different medium, which follows the same structure. You may ask them to describe the pattern, what comes next, what the rule is for their pattern, etc. If a child can do this confidently, they could be asked to recreate the same pattern rule with different objects. 'Can you use the nature basket to create a pattern with the same rule?' The child would need to recognise they need three different items, one of which is duplicated. They may say they will use a twig instead of the circle, a leaf instead of the square, a conker instead of the triangle, and create this instead:	• providing a range of experiences where children can create a pattern using a coding structure • ensuring children can follow the patterns they have coded.
Making a pattern which repeats around a circle	**Practical examples**
As children become more experienced with the structures of patterns, they can investigate whether patterns can continue indefinitely in a circle. Linking elephants, camels or making a necklace can provoke discussion about this. You then might lead discussions about whether the pattern works and how you can tell. If it doesn't work, can children explain why, and correct it so it does? Circles allow children to adjust the circle size, so they can add or take out items.	• making circular patterns such as necklaces, circles of linking elephants or camels • using pre-given circles to create a border, such as on or around a paper plate • exploring which patterns work, which don't, and why • offering a unit of the pattern and asking the child if they can include it in their pattern • making patterns around rectangular or other shaped frames.
Making a pattern around a border with a fixed number of space	**Practical examples**
This is where the children explore creating a pattern around a given space. In these sorts of activities, children have the additional challenge of recognising if their pattern can 'work' – fit into the given space. It is useful to include indoor and outdoor spaces, e.g. creating an outdoor reading area and defining it with a border of carpet tiles. Children can create a pattern on the carpet tiles with cubes to see if their pattern works, e.g. one coloured cube per tile. When exploring if a pattern works or not, draw attention to the number of spaces and the size of the unit of repeat.	• creating borders around defined spaces in the learning environment, i.e. a garden for the teddy bears, an outdoor reading area, etc. • encouraging children to predict if the pattern could 'keep going', voting on this and discussing their thoughts and reasons with a partner

Pattern-spotting around us	Practical examples
As children become pattern experts, look for opportunities to spot and study patterns in the environment. These patterns could be in construction, fabric, wrapping paper, wallpaper, etc. Look for opportunities to identify the unit of repeat and explain how it repeats. Consider other patterns, such as growing patterns, extending a cross shape, or spotting 'staircase' patterns of numbers going up in ones or twos. Children may make and spot spatial patterns, for example reflecting shapes or reversing an image. Stories and rhymes present a good opportunity to explore a growing pattern, e.g. 'There was an Old Lady who Swallowed a Fly', or 'A Squash and a Squeeze'. Explore representing these diagrammatically – to see a staircase pattern, for example.	• exploring patterns in stories, songs and rhymes • where possible, representing these diagrammatically to support pattern-spotting, and predicting what will happen next, and why • inviting children to spot patterns in the home environment, or bring in examples from home • looking at fabric patterns from different cultural traditions: discussing the patterns in terms of what stays the same and what is different • designing wrapping paper for a specific event that involves creating a pattern which the children can describe.
Common errors in this area may include: • not recognising a pattern such as ABBA (e.g. stating that patterns cannot have two of the same colour together) • when copying or extending a pattern, changing it before making three repeats • spotting that there is an error but not being able to describe it • identifying an error but not being able to correct it • correcting an error by making a 'local correction', which just moves the problem along (e.g. by adding an extra item when colours have been swapped) • describing the whole pattern instead of identifying the part which repeats, or the unit of repeat.	What to look for can a child: • continue, copy and create an AB pattern? • identify the pattern rule (unit of repeat) in an AB pattern? • continue, copy and create ABB, ABBC (etc.) patterns? • identify the pattern rule (unit of repeat) in ABB, ABBC (etc.) patterns? • spot an error and 'correct' a pattern? • explain whether a circular pattern is continuous or not?

Math Early Years Progression Charts – Shape and Space

Mathematically, the areas of shape and space are about developing visualising skills and understanding relationships, such as the effects of movement and combining shapes together, rather than just knowing vocabulary. Spatial skills are important for understanding other areas of maths and children need structured experiences to ensure they develop these. Here, the focus is on actively exploring spatial relations and the properties of shapes, in order to develop mathematical thinking (rather than on shape classification, which requires prior knowledge of properties). This section is concerned with developing the two aspects of spatial awareness and shape awareness, with some progression identified within each.

Developing spatial awareness: experiencing different viewpoint	Practical examples
Children need opportunities to move both themselves and objects around, so they see things from different perspectives. This will support them in visualising how things will appear when turned around and imagining how things might fit together. They need to make constructions, patterns and pictures, and select shapes which will fit when rotated or flipped in insert boards, shape sorters and jigsaws. These experiences will support them in noticing the results of rotating and reflecting images, and in visualising these.	• riding trikes around interesting routes • construction activities • printing and making pictures and patterns with shapes • posting boxes • jigsaws • making a complete circuit with a train track • directing a simple robot or remote-controlled toy vehicle along a route • tangrams: 'Can you make a person with the shapes?' • with toys in a line: 'Can you say what the teddy on the other side is seeing?'

Developing spatial vocabulary	Practical examples
Children need opportunities to be exposed to and to use the language of position and direction: position: 'in', 'on', 'under' direction: 'up', 'down', 'across'. Children also need opportunities to use terms which are relative to the viewpoint: 'in front of', 'behind', 'forwards', 'backwards' ('left' and 'right' to be used later on as ideas develop). Create as many opportunities as possible to explore this language, taking advantage of play in the outdoors to explore sequences of body movements (following obstacle courses, directing a friend, etc.).	•hunting for hidden objects, with some prompts, e.g. 'Look behind the bicycle store, take three steps from the front of the art cupboard…' • developing and talking about small-world scenarios, e.g. doll's house, miniature village, play park • acting out their own versions of well-known stories where characters negotiate routes and obstacles, for example 'We're Going on a Bear Hunt' • directing each other as robots.
Shape awareness: developing shape awareness through construction	**Practical examples**
Through play – particularly in construction – children have lots of opportunities to explore shapes, the attributes of particular shapes, and to select shapes to fulfil a particular need. Support this exploration by discussing items built by children in terms of how towers are built and why certain shapes are chosen to make a tower, and the space that has been created within an enclosure. Ask: 'How did you make that tower?', 'Why were those blocks good ones to use?'	• construction with structured and unstructured materials • making dens with varied materials outdoor
Representing spatial relationships	**Practical examples**
Small world play and model building provide lots of opportunities for children to describe things being 'in front of', 'behind', 'on top of' etc., and to consider objects from different perspectives. Drawing representations of these relationships is a further challenge. These drawings may include a simple representation of a three-dimensional object from a different viewpoint. For example, 'can you draw your construction from above, looking down on it?'	• designing a plan for a garden or play area, using a small tray with sand, twigs, building bricks, etc. • drawing or making a simple map of a route with 'landmarks', e.g. houses and trees • following a simple map of an excursion.
Identifying similarities between shapes	**Practical examples**
Children need opportunities to construct and create things that represent objects in their environment. As they do this, they should notice shape properties of the object that they want to represent; encourage them to think about the appropriateness of the shapes they choose. Examples of this may include representing a ball as a circle, building a train from wooden rectangular blocks, or using a curved block for the elephant's trunk.	• stories as a prompt for creating representations, e.g. building a house for the three bears • making pictures with found materials, as well as structured shapes and blocks.
Showing awareness of properties of shape	**Practical examples**
At this stage, children show increasing intentionality in their selection of shapes, for example using cylinders to represent wheels because they can roll. Draw children's attention to specific properties by using specific language in everyday situations, while children may use informal language. Properties may include: • curvedness • numbers of sides and corners (2D) or edges, faces and vertices (3D) • equal sides • parallel sides • angle size, including right angles • 2D shapes as faces of 3D shapes. In play, children show that they are utilising this knowledge by gathering specific items that are needed for their construction, e.g. making a bed for a teddy and gathering blocks of equal length to make the rectangle; taking	• making an insect hotel – selecting tube-like shapes from a collection of varied materials, some not fit for purpose • creating an extended channel for water to flow from a high container to a low one, some distance away • asking questions, for example: 'What shapes can you make with three people inside a loop of string? What about with four people?' 'What is the same and what is different about these?' • making shapes with sticks and with their own bodies

time with constructing corners so the shapes fit together to make a right angle.	• printing with shapes: 'What footprint do you think this cylinder will make?'
Describing properties of shape	**Practical examples**
As children construct, and appear to be utilising, the properties of shapes, informally ask them about their constructions and representations. Children may use comparisons such as 'ball-shaped' or 'house-shaped', or start to discriminate between shapes, e.g. a 'fat' triangle and a 'pointy' triangle, using informal language. With shapes such as triangles and rectangles, ensure that children are used to seeing a range of examples, and the same shape in different orientations, as well as different sizes, colours and materials.	• covering objects in foil and inviting children to justify their guesses about what is inside • making arrangements with a selection of different rectangles, including squares.
Developing an awareness of relationships between shapes	**Practical examples**
As children become more confident with specific shapes, encourage them to spot shapes within shapes. You might talk about small triangles making a bigger triangle or identifying 2D faces of 3D shapes. Pattern blocks are a useful resource, since children can point out the shapes they have used to make their whole pattern. Also encourage children to predict what will happen when paper is cut or folded, or shapes are combined. Ask: 'What shapes will we see?', 'What will happen if we fold the square in half?', 'What if we put two triangles together?'	• choosing 2D shapes to construct a 3D model, e.g. using triangles and rectangles to make a tent • making decorations by folding and cutting • making 3D shapes using interlocking shapes.

Common errors in this area may include:	What to look for can a child:
• children thinking that only regular triangles are triangles, only brick-like rectangles are rectangles (i.e. shapes are defined by their image, not by their properties) • children thinking that squares are only squares when the bottom is horizontal (i.e. shapes are defined by their orientation).	• select and rotate shapes to fit into a given space? • use positional vocabulary, including relative terms, to describe where things are in small-world play? • show intentionality in selecting shapes for a purpose, such as cylinders to roll? • make a range of constructions, including enclosures, and talk about the decisions they have made? • see shapes in different orientations and recognise that they are still that shape? • recognise a range of triangles and say how they know what they are?

Maths Early Years Progression Charts – Measure

Mathematically, measuring is based on the idea of using numbers of units in order to compare attributes, such as length or capacity. Although young children engage with using rulers and experience being measured in centimetres, kilos – and years! – the measuring units themselves are hard to understand. Children need to realise which attribute is being measured, e.g. weight as opposed to size, and the idea of conservation: that the amount stays the same, even if the appearance alters, e.g. if dough is stretched out or in bits. In order to understand units, they need to realise that two items can be compared using a third item, or 'go between', such as a stick. Finally, children need to understand how equal size units are used repeatedly to express an amount as a number. While young children can engage actively in making comparisons and exploring equivalence of length, volume, capacity and weight in different ways, some of these ideas are challenging and will develop later in primary school. For instance, weight (mass or density) is difficult to distinguish from size since it is invisible, and the concept of conservation is harder to understand for weight and capacity. Measuring with non-standard units of different sizes in order to appreciate the need for equal units is less effective with younger children, so centimetre cubes are recommended as accessible units. While time is also elusive to measure, young children can sequence events and, for example, count 'sleeps'. (Money as a measure of value is too advanced to consider here.)

Recognising attributes	Practical examples
In this first stage, children are able to recognise the specific attributes of (for example) length – that a stick is long; adults are tall. Their initial recognition may be a descriptor and over-applied (all straight things are long, and if it is not straight it cannot be long; all adults are tall). Children may use gestures or words to start to compare amounts of continuous quantities (length, capacity, weight), pointing to items that are big, tall, full or heavy. Children learn this vocabulary from the adults around them. Adults can seek opportunities to extend and refine conversations about things that are long, tall, high, heavy, full, etc. rather than just 'big'. At this point children may not be using comparative language such as, 'You are taller than me.'	• ensuring adults model language which highlights the specific attribute that is the focus of attention • dough modelling, which can provide a good opportunity to discuss the length of snakes, or the weight of different-sized lumps • water and sand-play, which can provide lots of opportunities to highlight capacity.
Comparing amounts of continuous quantities	**Practical examples**
Children can find something that is longer/shorter or heavier/lighter than a given reference item. They will utilise strategies such as direct comparison, e.g. placing objects side by side to determine which is longer. Children compare sizes, lengths, weights and capacities verbally and begin to use more specific terms, such as 'taller than', 'heavier than', 'lighter than', and 'holds more than', as well as more general comparative phrases, such as 'not enough', 'too much', and 'a lot more'. When comparing lengths directly, children need to ensure that they align the starting points, and compare like-for-like, e.g. straightening skipping ropes before comparing lengths. When comparing capacities directly, children can pour from one container to another to find which holds more, or find one that is the same. However, children may conclude that if one container overflows that must mean 'bigger'. Ensure that children have opportunities to see a jug of coloured water poured into a range of container shapes. Ask: 'What do you think will happen if we pour this tall thin jugful into this short fat dish?' Comparing weight can be tricky to conceptualise. One way is to identify that greater mass is shown by a greater downward pull. Ask children to hold a carrier bag; encourage them to notice it feels as though their hand is being pulled down when something heavy is put in it. Place a carrier bag in each hand and identify which one is heavier, by discussing which arm feels more pulled down. Show this using a simple spring balance or a box attached to elastic bands; identify that the elastic is being stretched by being pulled down, just like our arms. Explore the link to the balance scales to show that the heavier side goes down. If possible, exemplify this with a see-saw. Ensure that children are presented with large, light things and small, heavy things, to prevent the overgeneralisation that big means heavy and small means light.	• encouraging children to compare different attributes in everyday situations: 'I wonder who has the longest snake?' 'I wonder whose pot will hold the most water?' 'I wonder which ball is the heaviest?' • cutting a piece of ribbon as long as a child's arm and encouraging them to find things in the environment that are longer, shorter or the same length • focusing on asking for specific things according to their attributes. For example: 'Please can you pass me a ... that is ... than this one?' • when comparing directly, finding the odd one out, by providing a varied range of container shapes all containing the same amount of liquid except for one. 'Which one do you think is the odd one out? Why? How will we check? Were we right?' • posing see-saw problems, relating to weight: 'What can we do to make this side of the see-saw go down?' • using a simple spring balance to compare the weight of cargo for a toy boat • setting up a 'balancing station' with interesting things to weigh and to balance, indoors and outdoors • comparing different parcels, ensuring some of the smaller parcels are heavy, and some of the larger parcels are light.
Showing awareness of comparison in estimating and predicting	**Practical examples**
After children have had lots of practical experiences of comparing attributes, they can begin to estimate and to predict. For instance, they can start to consider which container would be best to store a specific item in: 'Which box should Teddy have?', 'What will fit in here?'	• making bed for a teddy using blocks • selecting a box or container to store a specific item • dressing dolls, and selecting different-sized clothes • finding things that will fit inside a matchbox.

Comparing indirectly	Practical examples
Children can then move onto using one thing to compare with two others, if, for example, asked to put things in order of height, weight or capacity. This may involve using a 'go between', for instance pouring a jugful of water into two bottles to see which holds more. Problems may be posed such as: 'I would like to move this table outside – do you think it will fit through the door?'	• making 'Russian doll'-type sets of nesting boxes from a collection • finding ways of seeing if the cupboard or carpet will fit in the role-play area without moving it • finding which of three pairs of shoes is heaviest for packing in a rucksack • packing a shopping bag, making sure the lightest items do not get squashed by heavier things.
Recognising the relationship between the size and number of units	**Practical examples**
Before children use standard units of measure, they begin to compare units of different sizes in practical contexts. One example may be in the water tray, where children realise it will take them longer to fill a bucket using teaspoons than bottles. Another example would be to fill identical containers with different-sized objects, e.g. small balls or large balls. These sorts of playful experiences enable children to make the generalisation that the smaller the unit the more we need of them, or the bigger the unit the less we need of them. These experiences can be extended by encouraging estimations: 'How many tennis balls do you think will fit in this tub?' Then check this by filling it. 'What if I try to fill it with ping pong balls? Will our answer stay the same? If not, why not?' In practical situations, these sorts of questions can be asked to support children in their justification of the choice of equipment. For example: 'What can I use to help fill the water tray? Which bag shall I use for my shopping? Which box would be best to store these buttons? Why did you think that is a good choice?'	•setting up an Estimation Station and guessing how many things are in the jar each day • making biscuits from a given amount of dough – choosing cutters to see who will make the most biscuits • choosing from a selection of spoons, ladles, etc., to see who can fill their pot the quickest with rice. How do you know who will be quickest
Beginning to use units to compare things	**Practical examples**
Experiences can be provided where children use units to 'measure' and compare. It is better to provide identical bricks, centimetre cubes or metre sticks so they can count physical units, rather than repeating the use of one item as with using hands or feet. In order to measure accurately, they need to ensure there are no gaps between units of measure. Using standard units helps children make connections with measuring in 'real life'. Young children also enjoy using height charts, measuring tapes, rulers, digital scales and timers, although will not yet fully understand how they work.	• setting up a 'filling station' with lots of different-sized containers to fill with beads, then comparing capacities • using large bricks to measure the height of individuals using metre sticks to see if an elephant or dinosaur would fit in the room • measuring the growth of a beanstalk or sunflower with interlocking centimetre cubes • comparing the capacity of different bottles by filling lots of glasses.
Beginning to use time to sequence events	**Practical examples**
Time is an abstract aspect to measure, and tricky in a range of ways. Although their age may be the most familiar number they know, children may have little sense of the unit of a 'year', and few may know the date of their birthday. In order to tell the time, children need a sense of number, space and time, the ability to count, and some notion of fractions (for half and quarter hours). In the Early Years we begin by drawing children's attention to sequencing of activities, important times in their day, and some sequences of time that are significant to them. Vocabulary that supports the understanding of this concept includes the positional language of 'before', 'after', 'next', and the relative terms 'yesterday' and 'tomorrow'. Knowing days of the week	• un-muddling visual timetables • making picture sequences for cooking instructions • describing sequences by re-telling stories • discussing 'o'clock' times at registration, lunchtime, snack time, tidy-up time, etc. • making their own timetable for a day – selecting activities and ordering them.

also helps children to keep track of time. Direct children's attention to the short hand, pointing to a number on a clock face, and identify what we are doing at that time.

Beginning to experience specific time durations	Practical examples
Children need to experience specific time spans in order to start to develop an overall sense of time. Initially, this may be based on familiar activities such as the number of 'sleeps' before an event. A class calendar may support this by highlighting certain events ('How many sleeps until the chicks start to hatch?', 'How many sleeps until my birthday?', 'How many sleeps until we go to the park?'). Discuss the number of sleeps getting smaller and what this means. By using timers in play, children can start to explore what they can do in a certain time period. For example: 'I wonder how long it takes you to run around the track?', 'How would we know if you were getting quicker?'. Identify that, in this case, the smaller the number of seconds the quicker you are getting (this is tricky for a child, as usually bigger numbers are 'better'). Children may also have the opportunity to see how many things they can do in a minute. For example: 'How many play people can you rescue from the pit?' (Wrap fabric around a water tray to create small gaps though which people can be rescued.)	• events on a class calendar to count down to • timers provided for children to set and respond to challenges; e.g. 'I wonder if we can run as fast as a cheetah', 'I wonder how many hops I can do in ten seconds', 'I wonder how many times I can write my name in a minute', etc. • time durations with songs or music.

Common errors in this area may include:	What to look for can a child:
• keeping track of events, e.g. 'Have I had my lunch yet?' • positional language associated with time; muddling the relative terms 'yesterday' and 'tomorrow' • using 'long' to describe the shape of something (e.g. a block that is much longer than it is wide) rather than to compare lengths • not taking into account both ends as the starting and stopping point • not being able to say 'than' in the phrase, 'this is longer than that' • not understanding that units must cover a complete length, with no gaps or overlaps, demonstrated by thinking that measuring is about counting units placed along something, or putting a ruler alongside and saying a number not understanding that units must be equal.	• find something that is longer, shorter, heavier, lighter (etc.) than a reference item? • find an appropriate container for a specific item? • describe the location of something using positional language? • accurately use the relative terms 'yesterday' and 'tomorrow'? • order a short sequence of events?

Number: Addition and Subtraction

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NUMBER BONDS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
represent and use number bonds and related subtraction facts within 20	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100				
MENTAL CALCULATION					
add and subtract one-digit and two-digit numbers to 20, including zero	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers * adding three one-digit numbers	add and subtract numbers mentally, including: * a three-digit number and ones * a three-digit number and tens * a three-digit number and hundreds		add and subtract numbers mentally with increasingly large numbers	perform mental calculations, including with mixed operations and large numbers
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot				use their knowledge of the order of operations to carry out calculations involving the four operations

WRITTEN METHODS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction	add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate	add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)	
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					
	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	estimate the answer to a calculation and use inverse operations to check answers	estimate and use inverse operations to check answers to a calculation	use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.

PROBLEM SOLVING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures * applying their increasing knowledge of mental and written methods	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why	solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why
	solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change (copied from Measurement)				Solve problems involving addition, subtraction, multiplication and division

2.3 Maths Progression Map Algebra

Algebra

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EQUATIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and *missing number problems* such as 7 = □ - 9 (copied from Addition and Subtraction)	recognise and use the inverse relationship between addition and subtraction and use this to check calculations and *missing number* problems. (copied from Addition and Subtraction)	solve problems, *including missing number* problems, using number facts, place value, and more complex addition and subtraction. (copied from Addition and Subtraction) solve problems, *including missing number* problems, involving multiplication and division, including integer scaling (copied from Multiplication and Division)		use the properties of rectangles to deduce related facts and find *missing lengths and angles* (copied from Geometry: Properties of Shapes)	express missing number problems algebraically
	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 (copied from Addition and Subtraction)				find pairs of numbers that satisfy number sentences involving two unknowns
represent and use number bonds and related subtraction facts within 20 (copied from Addition and Subtraction)					enumerate all possibilities of combinations of two variables

FORMULAE					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit. (Copied from NSG measurement)		use simple formulae recognise when it is possible to use *formulae* for area and volume of shapes (copied from Measurement)

SEQUENCES					
sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening (copied from Measurement)	compare and sequence intervals of time (copied from Measurement) order and arrange combinations of mathematical objects in patterns (copied from Geometry: position and direction)				generate and describe linear number sequences

2.4 Maths Progression Map Fractions

COUNTING IN FRACTIONAL STEPS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)	count up and down in tenths	count up and down in hundredths		
RECOGNISING FRACTIONS					
recognise, find and name a half as one of two equal parts of an object, shape or quantity	recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity	recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators	recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents (appears also in Equivalence)	
		recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.			
recognise, find and name a quarter as one of four equal parts of an object, shape or quantity		recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
COMPARING FRACTIONS					
		compare and order unit fractions, and fractions with the same denominators		compare and order fractions whose denominators are all multiples of the same number	compare and order fractions, including fractions >1

COMPARING DECIMALS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			compare numbers with the same number of decimal places up to two decimal places	read, write, order and compare numbers with up to three decimal places	identify the value of each digit in numbers given to three decimal places
ROUNDING INCLUDING DECIMALS					
			round decimals with one decimal place to the nearest whole number	round decimals with two decimal places to the nearest whole number and to one decimal place	solve problems which require answers to be rounded to specified degrees of accuracy
EQUIVALENCE (INCLUDING FRACTIONS, DECIMALS AND PERCENTAGES)					
	write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	recognise and show, using diagrams, equivalent fractions with small denominators	recognise and show, using diagrams, families of common equivalent fractions	identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination
			recognise and write decimal equivalents of any number of tenths or hundredths	read and write decimal numbers as fractions (e.g. 0.71 = $\frac{71}{100}$)	associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $\frac{3}{8}$)
				recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents	
			recognise and write decimal equivalents to $\frac{1}{4}$; $\frac{1}{2}$; $\frac{3}{4}$	recognise the per cent symbol (%) and understand that per cent relates to "number of parts per hundred", and write percentages as a fraction with denominator 100 as a decimal fraction	recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.

ADDITION AND SUBTRACTION OF FRACTIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		add and subtract fractions with the same denominator within one whole (e.g. $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$)	add and subtract fractions with the same denominator	add and subtract fractions with the same denominator and multiples of the same number	add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions
				recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number (e.g. $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1\frac{1}{5}$)	

MULTIPLICATION AND DIVISION OF FRACTIONS					
				multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams	multiply simple pairs of proper fractions, writing the answer in its simplest form (e.g. $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$)
					multiply one-digit numbers with up to two decimal places by whole numbers
					divide proper fractions by whole numbers (e.g. $\frac{1}{3} \div 2 = \frac{1}{6}$)

MULTIPLICATION AND DIVISION OF DECIMALS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					multiply one-digit numbers with up to two decimal places by whole numbers
			find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths		multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
					identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places
					associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. $^3/_8$)
					use written division methods in cases where the answer has up to two decimal places

PROBLEM SOLVING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
		solve problems that involve all of the above	solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number	solve problems involving numbers up to three decimal places	
			solve simple measure and money problems involving fractions and decimals to two decimal places.	solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}, \frac{1}{4}, \frac{1}{5}, \frac{2}{5}, \frac{4}{5}$ and those with a denominator of a multiple of 10 or 25.	

2.5 Maths Progression Map Geometry – Position and Direction

Geometry: Position and Direction

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POSITION, DIRECTION AND MOVEMENT					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
describe position, direction and movement, including half, quarter and three-quarter turns.	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		describe positions on a 2-D grid as coordinates in the first quadrant	identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed	describe positions on the full coordinate grid (all four quadrants)
			describe movements between positions as translations of a given unit to the left/right and up/down		draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
			plot specified points and draw sides to complete a given polygon		
PATTERN					
	order and arrange combinations of mathematical objects in patterns and sequences				

2.6   Maths Progression Map Geometry – Shape

IDENTIFYING SHAPES AND THIER PROPERTIES					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line		identify lines of symmetry in 2-D shapes presented in different orientations	identify 3-D shapes, including cubes and other cuboids, from 2-D representations	recognise, describe and build simple 3-D shapes, including making nets (appears also in Drawing and Constructing)
	identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces				illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius
	identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]				

DRAWING AND CONSTRUCTING					
		draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them	complete a simple symmetric figure with respect to a specific line of symmetry	draw given angles, and measure them in degrees ($^{\circ}$)	draw 2-D shapes using given dimensions and angles
					recognise, describe and build simple 3-D shapes, including making nets (appears also in Identifying Shapes and Their Properties)

COMPARING AND CLASSIFYING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	compare and sort common 2-D and 3-D shapes and everyday objects		compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes	use the properties of rectangles to deduce related facts and find missing lengths and angles	compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons
				distinguish between regular and irregular polygons based on reasoning about equal sides and angles	

ANGLES					
		recognise angles as a property of shape or a description of a turn		know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles	
		identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	identify acute and obtuse angles and compare and order angles up to two right angles by size	identify: * angles at a point and one whole turn (total 360°) * angles at a point on a straight line and ½ a turn (total 180°) * other multiples of 90°	recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
		identify horizontal and vertical lines and pairs of perpendicular and parallel lines			

2.7   Maths Progression Map Measurement

COMPARING AND ESTIMATING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] * time [e.g. quicker, slower, earlier, later]	compare and order lengths, mass, volume/capacity and record the results using >, < and =		estimate, compare and calculate different measures, including money in pounds and pence (also included in Measuring)	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes (also included in measuring) estimate volume (e.g. using 1 cm^3 blocks to build cubes and cuboids) and capacity (e.g. using water)	calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3.
sequence events in chronological order using language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]	compare and sequence intervals of time	compare durations of events, for example to calculate the time taken by particular events or tasks			
		estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Telling the Time)			

MEASURING and CALCULATING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
measure and begin to record the following: * **lengths and heights** * **mass/weight** * **capacity and volume** * **time** (hours, minutes, seconds**)**	choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	measure, compare, add and subtract: **lengths** (m/cm/mm); **mass** (kg/g); **volume/capacity** (l/ml)	estimate, compare and calculate **different measures,** including **money in pounds and pence** (appears also in Comparing)	use all four operations to solve problems involving measure (e.g. **length, mass, volume, money**) using decimal notation including scaling.	solve problems involving the calculation and conversion of **units of measure**, using decimal notation up to three decimal places where appropriate (appears also in Converting)
		measure the **perimeter** of simple 2-D shapes	measure and calculate the **perimeter** of a rectilinear figure (including squares) in centimetres and metres	measure and calculate the **perimeter** of composite rectilinear shapes in centimetres and metres	recognise that shapes with the same areas can have different **perimeters** and vice versa

MEASURING and CALCULATING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
recognise and know the value of different denominations of **coins and notes**	recognise and use symbols for pounds (**£**) and **pence (p)**; combine amounts to make a particular value find different combinations of coins that equal the same amounts of money **solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change	add and subtract amounts of **money** to give change, using both £ and p in practical contexts			
			find the area of rectilinear shapes by counting squares	calculate and compare the area of squares and rectangles including using standard units, square centimetres (cm^2) and square metres (m^2) and estimate the area of irregular shapes *recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})* (copied from Multiplication and Division)	calculate the area of parallelograms and triangles calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm^3) and cubic metres (m^3), and extending to other units [e.g. mm^3 and km^3]. recognise when it is possible to use formulae for area and volume of shapes

TELLING THE TIME					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.	tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times.	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)		
recognise and use language relating to dates, including days of the week, weeks, months and years	know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes, hours and o'clock; use vocabulary such as a.m./p.m., morning, afternoon, noon and midnight (appears also in Comparing and Estimating)			
			solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Converting)	solve problems involving converting between units of time	

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CONVERTING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)	know the number of seconds in a minute and the number of days in each month, year and leap year	convert between different units of measure (e.g. kilometre to metre; hour to minute)	convert between different units of metric measure (e.g. kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)	use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places
			read, write and convert time between analogue and digital 12 and 24-hour clocks (appears also in Converting)	solve problems involving converting between units of time	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate (appears also in Measuring and Calculating)
			solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days (appears also in Telling the Time)	understand and use equivalences between metric units and common imperial units such as inches, pounds and pints	convert between miles and kilometres

2.8 Maths Progression Map Multiplication & Division

MULTIPLICATION & DIVISION FACTS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count in multiples of twos, fives and tens (copied from Number and Place Value)	*count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value)	*count from 0 in multiples of 4, 8, 50 and 100* (copied from Number and Place Value)	*count in multiples of 6, 7, 9, 25 and 1 000* (copied from Number and Place Value)	*count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000* (copied from Number and Place Value)	
	recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables	recall multiplication and division facts for multiplication tables up to 12 × 12		
MENTAL CALCULATION					
		write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Written Methods)	use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers	multiply and divide numbers mentally drawing upon known facts	perform mental calculations, including with mixed operations and large numbers
	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot		recognise and use factor pairs and commutativity in mental calculations (appears also in Properties of Numbers)	multiply and divide whole numbers and those involving decimals by 10, 100 and 1000	*associate a fraction with division and calculate decimal fraction equivalents (e.g. 0.375) for a simple fraction (e.g. ³/₈)* (copied from Fractions)

WRITTEN CALCULATION					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods (appears also in Mental Methods)	multiply two-digit and three-digit numbers by a one-digit number using formal written layout	multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers	multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication
				divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context	divide numbers up to 4-digits by a two-digit whole number using the formal written method of short division where appropriate for the context divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context
					use written division methods in cases where the answer has up to two decimal places (copied from Fractions (including decimals))

PROPERTIES OF NUMBERS: MULTIPLES, FACTORS, PRIMES, SQUARE AND CUBE NUMBERS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			recognise and use factor pairs and commutativity in mental calculations (repeated)	identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers establish whether a number up to 100 is prime and recall prime numbers up to 19	identify common factors, common multiples and prime numbers *use common factors to simplify fractions; use common multiples to express fractions in the same denomination* *(copied from Fractions)*
				recognise and use square numbers and cube numbers, and the notation for squared (^{2}) and cubed (^{3})	*calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm^3) and cubic metres (m^3), and extending to other units such as mm^3 and km^3* *(copied from Measures)*

ORDER OF OPERATIONS					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
					use their knowledge of the order of operations to carry out calculations involving the four operations
INVERSE OPERATIONS, ESTIMATING AND CHECKING ANSWERS					
		estimate the answer to a calculation and use inverse operations to check answers (copied from Addition and Subtraction)	*estimate and use inverse operations to check answers to a calculation (copied from Addition and Subtraction)*		use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy

PROBLEM SOLVING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts	solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects	solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates	solve problems involving addition, subtraction, multiplication and division *solve problems involving similar shapes where the scale factor is known or can be found* *(copied from Ratio and Proportion)*

2.9   Maths Progression Map Place Value

COUNTING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			count backwards through zero to include negative numbers	interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero	use negative numbers in context, and calculate intervals across zero
count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	count from 0 in multiples of 4, 8, 50 and 100;	count in multiples of 6, 7, 9, 25 and 1000	count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000	
given a number, identify one more and one less		find 10 or 100 more or less than a given number	find 1000 more or less than a given number		
COMPARING NUMBERS					
use the language of: equal to, more than, less than (fewer), most, least	compare and order numbers from 0 up to 100; use <, > and = signs	compare and order numbers up to 1000	order and compare numbers beyond 1000 *compare numbers with the same number of decimal places up to two decimal places* *(copied from Fractions)*	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit *(appears also in Reading and Writing Numbers)*	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit *(appears also in Reading and Writing Numbers)*
IDENTIFYING, REPRESENTING AND ESTIMATING NUMBERS					
identify and represent numbers using objects and pictorial representations including the number line	identify, represent and estimate numbers using different representations, including the number line	identify, represent and estimate numbers using different representations	identify, represent and estimate numbers using different representations		

READING AND WRITING NUMBERS (including Roman Numerals)					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
read and write numbers from 1 to 20 in numerals and words.	read and write numbers to at least 100 in numerals and in words	read and write numbers up to 1000 in numerals and in words		read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit *(appears also in Comparing Numbers)*	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit *(appears also in Understanding Place Value)*
		tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks *(copied from Measurement)*	read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	
UNDERSTANDING PLACE VALUE					
	recognise the place value of each digit in a two-digit number (tens, ones)	recognise the place value of each digit in a three-digit number (hundreds, tens, ones)	recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit *(appears also in Reading and Writing Numbers)*	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit *(appears also in Reading and Writing Numbers)*
			find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as units, tenths and hundredths *(copied from Fractions)*	*recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents* *(copied from Fractions)*	*identify the value of each digit to three decimal places and multiply and divide numbers by 10, 100 and 1000 where the answers are up to three decimal places* *(copied from Fractions)*

ROUNDING					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			round any number to the nearest 10, 100 or 1000	round any number up to 1 000 000 to the nearest 10, 100, 1 000, 10 000 and 100 000	round any whole number to a required degree of accuracy
			round decimals with one decimal place to the nearest whole number *(copied from Fractions)*	*round decimals with two decimal places to the nearest whole number and to one decimal place* *(copied from Fractions)*	*solve problems which require answers to be rounded to specified degrees of accuracy* *(copied from Fractions)*
PROBLEM SOLVING					
	use place value and number facts to solve problems	solve number problems and practical problems involving these ideas.	solve number and practical problems that involve all of the above and with increasingly large positive numbers	solve number problems and practical problems that involve all of the above	solve number and practical problems that involve all of the above

2.10 Maths Progression Map Ratio and Proportion

					Year 6
Statements only appear in Year 6 but should be connected to previous learning, particularly fractions and multiplication and division					
					solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts
					solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
					solve problems involving similar shapes where the scale factor is known or can be found
					solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.

2.11 Maths Progression Map Statistics

Statistics

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Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
INTERPRETING, CONSTRUCTING AND PRESENTING DATA					
	interpret and construct simple pictograms, tally charts, block diagrams and simple tables	interpret and present data using bar charts, pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs	complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems
	ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity				
	ask and answer questions about totalling and comparing categorical data				
SOLVING PROBLEMS					
		solve one-step and two-step questions [e.g. 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	solve comparison, sum and difference problems using information presented in a line graph	calculate and interpret the mean as an average

2.12 Maths End Points By Year - EYFS:

Reception EYFS Maths Name:
40-60 Number
Recognise some numerals of personal significance. Recognises numerals 1 to 5.
• Counts up to three or four objects by saying one number name for each item.
• Counts actions or objects which cannot be moved.
• Counts objects to 10, and beginning to count beyond 10.
• Counts out up to six objects from a larger group.
• Selects the correct numeral to represent 1 to 5, then 1 to 10 objects.
• Counts an irregular arrangement of up to ten objects.
• Estimates how many objects they can see and checks by counting them.
• Uses the language of 'more' and 'fewer' to compare two sets of objects.
• Finds the total number of items in two groups by counting all of them.
• Says the number that is one more than a given number.
• Finds one more or one less from a group of up to five objects, then ten objects.
• In practical activities and discussion, beginning to use the vocabulary involved in adding and subtracting.
• Records, using marks that they can interpret and explain.
• Begins to identify own mathematical problems based on own interests and fascinations.
ELG Number Children count reliably with numbers 1 - 20, place them in order & say which number is one more/one less than a number.
Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer.
They solve problems, including doubling, halving and sharing.
GDS Number Children estimate a number of objects and check quantities by counting up to 20.
They solve practical problems that involve combining groups of 2, 5 or 10, or sharing into equal groups.
40-60 Shape, Space & Measure
Beginning to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes.
• Selects a particular named shape.
• Can describe their relative position such as 'behind' or 'next to'.
• Orders two or three items by length or height.
• Orders two items by weight or capacity.
• Uses familiar objects and common shapes to create and recreate patterns and build models.
• Uses everyday language related to time.
• Beginning to use everyday language related to money.
• Orders and sequences familiar events.
ELG Shape, Space & Measure
Children use everyday language to talk about size, weight, capacity, position, distance, time &money to compare quantities & objects & to solve problems.
They recognise, create and describe patterns.
They explore characteristics of everyday objects and shapes and use mathematical language to describe them.
GDS Shape, Space & Measure
Children estimate, measure, weigh and compare and order objects.
They talk about properties, position and time.

Year 1 Maths Curriculum Name:			
Numbers and the number system			
count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number			
count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less			
identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least			
read and write numbers from 1 to 20 in numerals and words			
Addition and subtraction			
read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs			
represent and use number bonds and related subtraction facts within 20			
add and subtract one-digit and two-digit numbers to 20, including zero			
solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \_ - 9$			
Multiplication and division			
solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.			
Fractions and decimals			
recognise, find and name a half as one of two equal parts of an object, shape or quantity			
recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.			
Measurement			
compare, describe and solve practical problems for: lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] mass/weight [for example, heavy/light, heavier than, lighter than] capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] time [for example, quicker, slower, earlier, later]			
measure and begin to record the following: lengths and heights mass/weight capacity and volume time (hours, minutes, seconds)			
recognise and know the value of different denominations of coins and notes			
sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]			
recognise and use language relating to dates, including days of the week, weeks, months and years			
tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.			
Geometry			
recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]			
Describe position, direction and movement, including whole, half, quarter and three-quarter turns			

Year 2 Maths Curriculum Name:			
Numbers and the number system			
count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward			
recognise the place value of each digit in a two-digit number (tens, ones)			
identify, represent and estimate numbers using different representations, including the number line			
compare and order numbers from 0 up to 100; use <, > and = signs			
read and write numbers to at least 100 in numerals and in words			
use place value and number facts to solve problems.			
Addition and subtraction			
solve problems with addition and subtraction:			
using concrete objects and pictorial representations, including those involving numbers, quantities and measures			
applying their increasing knowledge of mental and written methods			
recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100			
add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones a two-digit number and tens two two-digit numbers adding three one-digit numbers			
show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot			
recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.			
Multiplication and division			
recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers			
calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs			
show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot			
solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts			
Fractions and decimals			
recognise, find, name and write fractions 1/3, ¼, 2/4 and ¾ of a length, shape, set of objects or quantity			
write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2			
Measurement			
choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels			
compare and order lengths, mass, volume/capacity and record the results using >, < and =			
recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value find different combinations of coins that equal the same amounts of money			
solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change			
compare and sequence intervals of time			
tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times			
know the number of minutes in an hour and the number of hours in a day.			
Geometry			
identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line			
identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces			
identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]			
compare and sort common 2-D and 3-D shapes and everyday objects.			
order and arrange combinations of mathematical objects in patterns and sequences			
use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)			
Statistics			
interpret and construct simple pictograms, tally charts, block diagrams and simple tables			
ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity			
ask and answer questions about totalling and comparing categorical data.			

Year 3 Maths Curriculum Name:			
Numbers and the number system			
count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number			
recognise the place value of each digit in a three-digit number (hundreds, tens, ones)			
compare and order numbers up to 1000			
identify, represent and estimate numbers using different representations			
read and write numbers up to 1000 in numerals and in words			
solve number problems and practical problems involving these ideas.			
Addition and subtraction			
add and subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens a three-digit number and hundreds			
add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction			
estimate the answer to a calculation and use inverse operations to check answers			
solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction			
Multiplication and division			
recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables			
write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods			
solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.			
Fractions and decimals			
count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10			
count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10			
recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators			
recognise and show, using diagrams, equivalent fractions with small denominators			
add and subtract fractions with the same denominator within one whole [for example, 1/7 + 3/7 = 4/7]			
compare and order unit fractions, and fractions with the same denominators			
solve problems that involve all of the above.			
Measurement			
measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)			
measure the perimeter of simple 2-D shapes			
add and subtract amounts of money to give change, using both £ and p in practical contexts			
tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks			
estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight			
know the number of seconds in a minute and the number of days in each month, year and leap year compare durations of events [for example to calculate the time taken by particular events or tasks].			
Geometry			
draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them			
recognise angles as a property of shape or a description of a turn			
identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle			
identify horizontal and vertical lines and pairs of perpendicular and parallel lines.			
Statistics			
interpret and present data using bar charts, pictograms and tables			
solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.			

Year 4 Maths Curriculum Name:			
Numbers and the number system			
count in multiples of 6, 7, 9, 25 and 1000			
find 1000 more or less than a given number			
count backwards through zero to include negative numbers			
recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones)			
order and compare numbers beyond 1000			
identify, represent and estimate numbers using different representations			
round any number to the nearest 10, 100 or 1000			
solve number and practical problems that involve all of the above and with increasingly large positive numbers			
read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value			
Addition and subtraction			
add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate			
estimate and use inverse operations to check answers to a calculation			
solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why			
Multiplication and division			
recall multiplication and division facts for multiplication tables up to 12×12			
use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers			
recognise and use factor pairs and commutativity in mental calculations			
multiply two-digit and three-digit numbers by a one-digit number using formal written layout			
solve problems involving multiplying and adding, including using the distributive law			
to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.			
Fractions and decimals			
recognise and show, using diagrams, families of common equivalent fractions			
count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.			
solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number			
add and subtract fractions with the same denominator			
recognise and write decimal equivalents of any number of tenths or hundredths			
recognise and write decimal equivalents to ¼, ½, ¾			
find the effect of dividing a one- or two-digit number by 10 and 100, identifying the			
value of the digits in the answer as ones, tenths and hundredths			
round decimals with one decimal place to the nearest whole number			
compare numbers with the same number of decimal places up to two decimal places			
solve simple measure and money problems involving fractions and decimals to two decimal places.			
Measurement			
Convert between different units of measure [for example, kilometre to metre; hour to minute]			
measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres			
find the area of rectilinear shapes by counting squares			
estimate, compare and calculate different measures, including money in pounds and Pence			
read, write and convert time between analogue and digital 12- and 24-hour clocks			
solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.			
Geometry			
compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes			
identify acute and obtuse angles and compare and order angles up to two right angles by size			
identify lines of symmetry in 2-D shapes presented in different orientations			
complete a simple symmetric figure with respect to a specific line of symmetry. describe positions on a 2-D grid as coordinates in the first quadrant			
describe movements between positions as translations of a given unit to the left/right and up/down			
plot specified points and draw sides to complete a given polygon.			
Statistics			
interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.			
solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs			

Year5 Maths Curriculum Name:			
Numbers and the number system			
read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit			
count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000			
interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero			
round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000			
solve number problems and practical problems that involve all of the above			
read Roman numerals to 1000 (M) and recognise years written in Roman numerals.			
Addition and subtraction			
add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction)			
add and subtract numbers mentally with increasingly large numbers			
use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy			
solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why			
Multiplication and division			
identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers			
identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers			
establish whether a number up to 100 is prime and recall prime numbers up to 19			
multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers			
multiply and divide numbers mentally drawing upon known facts			
divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context			
multiply and divide whole numbers and those involving decimals by 10, 100 and 1000			
recognise and use square numbers and cube numbers, and the notation for squared and cubed			
solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes			
solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign			
solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates			
Fractions and decimals			
compare and order fractions whose denominators are all multiples of the same number			
identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths			
recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number			
add and subtract fractions with the same denominator and denominators that are multiples of the same number			
multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams			
read and write decimal numbers as fractions [for example, 0.71 = 71/100]			
recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents			
round decimals with two decimal places to the nearest whole number and to one decimal place			
read, write, order and compare numbers with up to three decimal places			
solve problems involving number up to three decimal places			
recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal			
solve problems which require knowing percentage and decimal equivalents of ½, ¼, 1/5, 2/5 and 4/5 and those fractions with a denominator of a multiple of 10 or 25.			
Measurement			
convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre)			
understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints			
measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres			
calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2) and estimate the area of irregular shapes			
estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water]			
solve problems involving converting between units of time			
use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling			
Geometry			
identify 3-D shapes, including cubes and other cuboids, from 2-D representations			
know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles			
draw given angles, and measure them in degrees (o)			
identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and , 1/2 a turn (total 180o) other multiples of 90o			
use the properties of rectangles to deduce related facts and find missing lengths and angles			
distinguish between regular and irregular polygons based on reasoning about equal sides and angles.			
identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed			
Statistics			
solve comparison, sum and difference problems using information presented in a line graph			
complete, read and interpret information in tables, including timetables			

Year 6 Maths Curriculum Name:			
Numbers and the number system			
read, write, order and compare numbers up to 10 000 000 and determine the value of each digit			
round any whole number to a required degree of accuracy			
use negative numbers in context, and calculate intervals across zero			
solv e number and practical problems that involve all of the above			
Addition, subtraction, multiplication and division			
multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication			
perform mental calculations, including with mixed operations and large numbers			
divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context			
divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context			
identify common factors, common multiples and prime numbers			
use their knowledge of the order of operations to carry out calculations involving the four operations			
solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why			
solve problems involving addition, subtraction, multiplication and division			
use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.			
Fractions and decimals			
use common factors to simplify fractions; use common multiples to express fractions in the same denomination			
compare and order fractions, including fractions > 1			
add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions			
multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, ¼ x ½ = 1/8]			
divide proper fractions by whole numbers [for example, 1/3 ÷ 2 = 1/6]			
associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, 3/8]			
identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places			
multiply one-digit numbers with up to two decimal places by whole numbers			
use written division methods in cases where the answer has up to two decimal places			
solve problems which require answers to be rounded to specified degrees of accuracy			
recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.			
Ratio and Proportion			
solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts			
solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison			
solve problems involving similar shapes where the scale factor is known or can be found			
solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.			
Algebra			
use simple formulae			
generate and describe linear number sequences			
express missing number problems algebraically			
find pairs of numbers that satisfy an equation with two unknowns			
enumerate possibilities of combinations of two variables.			
Measurement			
solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate			
use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places			
convert between miles and kilometres			
recognise that shapes with the same areas can have different perimeters and vice versa			
recognise when it is possible to use formulae for area and volume of shapes			
calculate the area of parallelograms and triangles			
calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other unit[for example, mm3 and km3].			
Geometry			
draw 2-D shapes using given dimensions and angles			
recognise, describe and build simple 3-D shapes, including making nets			
compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons			
illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius			
recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles			
describe positions on the full coordinate grid (all four quadrants)			
draw and translate simple shapes on the coordinate plane, and reflect them in the axes			
Statistics			
interpret and construct pie charts and line graphs and use these to solve problems			
calculate and interpret the mean as an average.			

2.13 Maths Teaching Sequences Summary

Autumn 1				
Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Numbers – Counting and recognising numbers - **Reception** Number – Number and place value – & Number addition and subtraction. **Year 1** **2 weeks** Number – Addition and subtraction **2 weeks** Shape, space and measures – Shape (2-D) & Shape, space and measures – Exploring patterns – **Reception** Geometry – Properties of shapes – **Year 1** **1 week** Shape, space and measures – Measures (length and height) – **Reception** Measurement (length and height) – **Year 1** **1 week**	Number – Number and place value **2 weeks** Number – Addition and subtraction **1 week** Geometry – Properties of shapes & Measurement (length and height) & Time **2 weeks**	Number and place value **1 week** Number – Addition and subtraction **2 week** Number – Multiplication and division **2 weeks** Measurement – Time **1 week**	Number and place value **1 week** Number – Addition and subtraction **2 week** Number – Multiplication and division **2 weeks** Measurement – Time **1 week**	Number and place value **1 week** Number – Addition and subtraction **2 week** Number – Multiplication and division **2 weeks** Measurement – Time **1 week**

Autumn 2				
Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Numbers –Adding and subtracting (adding) **Reception** Number – number and place value & Number – Multiplication and division **Year 1** **2 weeks** Numbers – Adding and subtracting (subtracting) **Reception** Number – addition and subtraction & number fractions **Year 1** **2 weeks** Shape, space and measures – Space **Reception** Geometry **Year 1** **1 week** Shape, space and measures – Measures (money) **1 week**	Number – Number and place Number – Multiplication and division **2 weeks** Number – Fractions **1 week** Number – Addition and subtraction **1 week** Measurement (money) & Geometry – Position and direction Plus Statistics Year 2 **1 week** Measurement – time **1 week**	Number – Fractions and decimals **2 weeks** Decimals **1 week** Measurement **1 week** Geometry – Properties of shape **1 week** Statistics **1 week**	Number – Fractions and decimals **2 weeks** Decimals **1 week** Measurement **1 week** Geometry – Properties of shape **1 week** Statistics **1 week**	Number – Fractions and decimals **2 weeks** Decimals **1 week** Measurement **1 week** Geometry – Properties of shape **1 week** Statistics **1 week**

Spring 1				
Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Numbers – Counting and recognising numbers – **Reception**	Number – Addition and subtraction	Number – Number and place value	Number – Number and place value	Number – Number and place value
Number – Number and place value – **Year 1**	**1 week**	**1 week**	**1 week**	**1 week**
1 week	Number – Number and place value Number – Multiplication and division	Number – Addition and Subtraction	Number – Addition and Subtraction	Number – Addition and Subtraction
Numbers – Counting and recognising numbers and solving problems – **Reception**	**2 weeks**	**2 weeks**	**2 weeks**	**2 weeks**
	Measurement (capacity/mass /time/money)	Number – Multiplication and Division	Number – Multiplication and Division	Number – Multiplication and Division
Number – Addition and subtraction - **Year 1**	**2 weeks**	**2 weeks**	**2 weeks**	**2 weeks**
1 week	Geometry – Properties of shapes	Measurement – Length, volume and capacity	Measurement – Length, volume and capacity	Measurement – Length, volume and capacity
Numbers – Adding and subtracting (adding) & solving problems – **Reception**	**1 week**	**1 week**	**1 week**	**1 week** **Y6 Shape**
Number – Number and place value & multiplication and division - **Year 1**				
2 weeks				
Shape, space and measures – Measures (weight/mass) Shape, space and measures				
1 week				

Spring 2				
Class 1	Class 2	Class 3	Class 4	Class 5
Numbers – Counting and recognising numbers **Reception** Number – Number and place value **Year 1** **1 week** Numbers – Adding and subtracting (subtracting) & Solving Problems **Reception** Addition and subtraction **Year 1** **2 weeks** Numbers – Solving problems (doubling and halving) **Reception** Number – Fractions **Year 1** **2 weeks** Shape, space and measures – Measures (time) & Capacity **1 week**	Number Number all operations **2 weeks** Number – Number and place value **1 week** Number – Fractions **1 week** Measurement (time) **Year 1** Statistics **Year 2** **1 week**	Number – Number and place value **1 week** Number – Addition and subtraction **1 week** Number – Fractions **1 week** Measurement – Perimeter **1 week** Statistics **1 week**	Number – Number and place value **1 week** Number – Addition and subtraction **1 week** Number – Fractions **1 week** Measurement – Perimeter **1 week** Statistics **1 week**	Number – Number and place value **1 week** Number – Addition and subtraction **1 week** Number – Fractions **1 week** Measurement – Perimeter **1 week** Statistics **1 week** FDPRP **1 week**

Summer 1				
Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Numbers – Counting and recognising numbers - & problem solving **Reception**

Number – Number and place value -
Year 1

1 week
Number – Addition and subtraction
Reception

Number – multiplication & division
Year 1

2 weeks
Shape, space and measures – Shape (2-D and 3-D) & Exploring Pattern & Time
Reception

Position and Direction **Year 1** & Measures

1 week | Number – Number and place value

1 week
Number – Addition and subtraction

2 weeks
Number – Fractions

1 week
Geometry – Position and direction – **Year 1**

Statistics - **Year 2**

1 week

Measurement

1 week | Number – Addition and Subtraction

2 weeks
Number –
Place value **(Y3)**

Decimals **(Y4)**

1 week
Measurement – Time

2 weeks | Number – Addition and Subtraction

2 weeks
Number – Fractions and Decimals
Percentages – **Y5**

2 weeks
Switch with addition and subtraction this term??

Measurement

1 week | Number – Addition and Subtraction

2 weeks
Number – Fractions and Decimals
Percentages – **Y5**
Shape, space and measures review – **Y6**

2 weeks

Measurement

1 week |

Summer 2				
Class 1	**Class 2**	**Class 3**	**Class 4**	**Class 5**
Numbers – Solving problems **Reception** Multiplication & division **Year 1** **2 weeks** Measures Shape & Money **Reception** Measures Shape and Time **Year 1** **2 weeks** Numbers – Solving problems (sharing) **Reception** Number- Fractions **Year 1** 1 week	Number – Number and place value & Multiplication and division **1 week** Number – Addition and subtraction **1 week** Number – Multiplication and division **1 week** Fractions **1 week** Measurement (length and height, and mass) **1 week** Measurement (time) **1 week**	Number – Multiplication and Division **2 weeks** Geometry – Properties of shapes **2 weeks** Statistics **1 week**	Number – Multiplication and Division **2 weeks** Geometry – Properties of shapes **2 weeks** Statistics 1 week	Number – Multiplication and Division **2 weeks** Geometry – Properties of shapes **2 weeks**

2.14 Maths Teaching Sequences by Class: Class 1

New concepts should always be introduced in a concrete way (see Calculations Policy for further details). Once secure in concrete methods, pictorial representations should be used before finally moving onto abstract methods.

Autumn 1	Reception	Year 1
	Baseline	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
Numbers – Counting and recognising numbers - Reception **Number – Number and place value –** **& Number addition and subtraction.** **Year 1** **2 weeks**	• Recognise some numerals of personal significance • Recognises numerals 1 to 5 (then 10 and 20) • Counts objects by saying one number name for each item • Counts actions or objects that cannot be moved • Records, using marks that they can interpret and explain • Counts out objects from a larger group • Selects the correct numeral to represent 1–5, then 1–10, then 1-20 objects • Counts an irregular arrangement of up to 10 objects •Counts objects to 10, and then beyond 10	• count, read and write numbers to 100 in numerals • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals • practising ordering [first, second, third] • read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20
Number – Addition and subtraction **2 weeks**	• Finds the total number of items in two groups by counting all of them • In practical activities and discussion, beginning to use the vocabulary involved in adding • In practical activities and discussion, beginning to use the vocabulary involved in subtracting • Records, using marks that they can interpret and explain [in the context of adding and subtracting] • Begins to identify own mathematical problems based on own interests and fascinations	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = -9$
Shape, space and measures – Shape (2-D) & Shape, space and measures – Exploring patterns – Reception **Geometry – Properties of shapes – Year 1** **1 week**	• Beginning to use mathematical names for 'solid' 3-D shapes and 'fl at' 2-D shapes, and mathematical terms to describe shapes • Selects a particular named shape [2-D only] • Uses familiar objects and common shapes to create and recreate patterns and build models • Recognises, creates and describes patterns.	• recognise and name common 2-D shapes, including: –2-D shapes [for example, rectangles (including squares), circles and triangles]
Shape, space and measures – Measures (length and height) – Reception - 1 week Measurement (length and height) – Year 1	• Orders two or three items by length or height • Uses everyday language to talk about size to compare quantities and objects to solve problems	• compare, describe and solve practical problems for lengths and heights [for example, long/short, longer/shorter, tall/ short, double/half] • measure and begin to record lengths and heights
	Assess and review	
Autumn 2	**Reception**	**Year 1**
Numbers –Adding and subtracting (adding) Reception **Number – number and place value & Number –**	• Recognises numerals 1 to 10 then 20 • Records, using marks that they can interpret and explain • Counts objects to 10, and beyond 10 • Counts out objects from a larger group • Selects the correct numeral to represent 1–5, then 1–10, then 1-20 objects	• count in multiples of 2s, 5s and 10s • solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher

Multiplication and division **Year 1** **2 weeks**	• Counts an irregular arrangement of up to 10 objects • Estimates how many objects they can see and checks by counting them • Finds the total number of items in two groups by counting all of them • Says the number that is one more than a given number • Finds one more or one less from a group of up to five objects, then 10 objects • In practical activities and discussion, beginning to use the vocabulary involved in adding • Records, using marks that they can interpret and explain [in the context of adding and subtracting]	• understand multiplication and division through grouping and sharing small quantities **
Numbers – Adding and subtracting (subtracting) Reception **Number – addition and subtraction & number fractions** **Year 1** **2 weeks**	• Says the number that is one more than a given number • Finds one more or one less from a group of up to five objects, then 10 objects • In practical activities and discussion, beginning to use the vocabulary involved in adding • Records, using marks that they can interpret and explain [in the context of adding and subtracting]]	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = - 9$ • recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise and combine halves as parts of a whole
Shape, space and measures – Space Reception **Geometry Year 1** **1 week**	• Can describe their relative position such as 'behind' or 'next to' • Uses everyday language to talk about position, distance [and direction] to compare objects and to solve problems • Uses everyday language to talk about distance to compare objects and to solve problems	• describe position, direction and movement, including whole, half, quarter and three-quarter turns
Shape, space and measures – Measures (money) **I week**	• Uses everyday language to talk about money to compare quantities and objects to solve problems	• recognise and know the value of different denominations of coins and notes
	Assess and review	

As children's understanding deepens teaching will move more to pictorial and abstract representations. However, for those children who still need concrete materials, these should be used as appropriate.

Spring 1	Reception	Year 1
Numbers – Counting and recognising numbers – Reception **Number – Number and place value – Year 1** **1 week**	• Recognises numerals 1 to 10 then 20 • Records, using marks that they can interpret and explain • Counts objects to 10, and beginning to count up to 20 • Counts out objects from a larger group • Selects the correct numeral to represent $1 - 5$, then $1 - 10$ objects, then 1-20 objects • Counts an irregular arrangement of up to 10 objects • Estimates how many objects they can see and checks by counting them	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words • recognise and create repeating patterns with objects and with shapes

Numbers – Counting and recognising numbers and solving problems – Reception **Number – Addition and subtraction** **1 week**	• Uses the language of 'more' and 'fewer' to compare two sets of objects [to 10, then extend to 20] • Begins to identify own mathematical problems based on own interests and fascinations • Finds the total number of items in two groups by counting all of them • Says the number that is one more than a given number • Finds one more or one less from a group of up to five objects, then 10, then 20 objects • In practical activities and discussion, beginning to use the vocabulary involved in adding • In practical activities and discussion, beginning to use the vocabulary involved in subtracting • Records, using marks that they can interpret and explain [in the context of adding and subtracting] • Begins to identify own mathematical problems based on own interests and fascinations	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \, - 9$
Numbers – Adding and subtracting (adding) & solving problems **Number – Number and place value & multiplication and division** **2 weeks**	• Says the number that is one more than a given number • Finds one more or one less from a group of up to five objects, then 10 objects, then 20 • Uses quantities and objects to add two single-digit numbers and count on to find the answer [totals to 10 only] • Begins to identify own mathematical problems based on own interests and fascinations • Solves problems involving doubling and halving • Counts in twos, fives and tens • Solves problems involving grouping • Solves problems involving sharing	• count in multiples of 2s, 5s and 10s • solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • understand multiplication and division through grouping and sharing small quantities • make connections between arrays, number patterns and counting in 2,5 &10
Shape, space and measures – Measures (weight/mass)	• Orders two items by weight • Uses everyday language to talk about weight to compare quantities and objects to solve problems	• compare, describe and solve practical problems for mass/weight [for example, heavy/light, heavier than, lighter than)] • measure and begin to record mass/weight
Shape, space and measures **1 week**	• Beginning to use mathematical names for 'solid' 3-D shapes and 'fl at' 2-D shapes, and mathematical terms to describe shapes • Selects a particular named shape [3-D only] • Uses familiar objects and common shapes to create and recreate patterns and build models	• recognise and name common 3-D shapes, including: –3-D shapes [for example cuboids (including cubes), pyramids and spheres)]
	Assess and review	
Spring 2	**Reception**	**Year 1**
Numbers – Counting and recognising numbers Reception **Number – Number and place value Year 1** **1 week**	• Recognises numerals 1 to 20 • Records, using marks that they can interpret and explain • Counts objects to 10, & then 20 • Counts out objects from a larger group • Selects the correct numeral to represent 1 – 5, then 1 – 10 objects, then 20 objects. • Counts an irregular arrangement of up to 10 objects • Estimates how many objects they can see and checks by counting them • Uses the language of 'more' and 'fewer' to compare two sets of objects [to 10, then to 20]	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words
Numbers – Adding and subtracting (subtracting) & Solving Problems Reception	• Says the number that is one more than a given number • Finds one more or one less from a group of up to five objects, then 10, then 20 objects • Uses quantities and objects to subtract two single-digit numbers and count back to find the answer	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20 • add and subtract one-digit and two-digit numbers to 20, including 0

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| Addition and subtraction Year 1

2 weeks	• Begins to identify own mathematical problems based on own interests and fascinations In practical activities and discussion, beginning to use the vocabulary involved in adding • In practical activities and discussion, beginning to use the vocabulary involved in subtracting • Records, using marks that they can interpret and explain [in the context of adding and subtracting] • Uses quantities and objects to add two single-digit numbers and count on to find the answer [totals to 10 only] • Uses quantities and objects to subtract two single-digit numbers and count back to find the answer	• realise the effect of adding and subtracting zero in order to establish addition and subtraction as related operations • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = -9$
Numbers – Solving problems (doubling and halving) Reception Number – Fractions Year 1	• Solves problems involving doubling and halving	• recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • recognise and combine quarters as parts of a whole
Shape, space and measures – Measures (time) & Capacity

1 week | • Orders and sequences familiar events
• Measures short periods of time in simple ways
• Orders two items by capacity
• Uses everyday language to talk about capacity to compare quantities and objects to solve problems | • sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]
 • recognise and use language relating to dates, including days of the week, weeks, months and years
• tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
• compare, describe and solve practical problems for capacity and volume [for example, full/empty, more than, less than, quarter]
 • measure and begin to record capacity and volume |
| | Assess and review | |

Teaching now should be in the main using abstract representations, with emphasis on securing depth of learning and evidence of application across different scenarios and using and applying and problem solving foci. Once again there will be some children who still need to rely on pictorial/concrete examples and pupils should be encouraged to use jottings to support their manipulations and show their understanding.

Summer 1	Reception	Year 1
Numbers – Counting and recognising numbers - & problem solving Reception

Number – Number and place value - Year 1

1 week | • Recognises numerals 1 to 20
• Records, using marks that they can interpret and explain
• Uses the language of 'more' and 'fewer' to compare two sets of objects [to 10, then extend to 20]
• Counts reliably with numbers from 1 to 20
• Places numbers 1 to 20 in order
• Begins to identify own mathematical problems based on own interests and fascinations | • count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number
• count, read and write numbers to 100 in numerals
• given a number, identify 1 more and 1 less
• identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least
• read and write numbers from 1 to 20 in numerals and words
• recognise place value in numbers beyond 20 |
| Number – Addition and subtraction Reception

Number – multiplication & division | • Finds the total number of items in two groups by counting all of them
• Says the number that is one more than a given number to 20.
• Finds one more or one less from a group of up to five objects, then 10 objects
• In practical activities and discussion, beginning to use the vocabulary involved in adding | • read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs
 • represent and use number bonds and related subtraction facts within 20
 • add and subtract one-digit and two-digit numbers to 20, including 0 |

Year 1 **2 weeks**	• In practical activities and discussion, beginning to use the vocabulary involved in subtracting • Records, using marks that they can interpret and explain [in the context of adding and subtracting] • Uses quantities and objects to add two single-digit numbers and count on to find the answer • Uses quantities and objects to subtract two single-digit numbers and count back to find the answer • Begins to identify own mathematical problems based on own interests and fascinations .	• realise the effect of adding and subtracting zero in order to establish addition and subtraction as related operations • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = -9$ • solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • understand multiplication and division through grouping and sharing small quantities • make connections between arrays, number patterns and counting in twos, fives and tens
Shape, space and measures – Shape (2-D and 3-D) & Exploring Pattern & Time Reception **Position and Direction Year 1 & Measures** **1 week**	• Selects a particular named shape • Explores characteristics of 2-D shapes and uses mathematical language to describe • Explores characteristics of everyday objects and 3-D shapes and uses mathematical language to describe them. • Uses familiar objects and common shapes to create and recreate patterns and build models • Recognises, creates & describes patterns • Orders and sequences familiar events • Measures short periods of time in simple ways • Uses everyday language to talk about time to compare and to solve problems	• describe position, direction and movement, including whole, half, quarter and three-quarter turns • compare, describe and solve practical problems for: –lengths and heights [for example, long/short, longer/ shorter, tall/short, double/half] –mass/weight [for example, heavy/light, heavier than, lighter than] • measure and begin to record the following: –lengths and heights –mass/weight
	Assess and review	
Summer 2	**Reception**	**Year 1**
Numbers – Solving problems Reception **Multiplication & division Year 1** **2 weeks**	• Counts in two, fives and tens • Solves problems involving grouping • Begins to identify own mathematical problems based on own interests and fascinations • Solves problems involving doubling and halving • Solves problems involving sharing	• solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • double numbers and quantities • find simple fractions of objects, numbers and quantities
Measures Shape & Money Reception **Measures Shape and Time Year 1** **2 weeks**	• Uses everyday language to talk about money to compare quantities and objects to solve problems • Can describe their relative position such as 'behind' or 'next to' • Uses everyday language to talk about position, distance [and direction] to compare objects and to solve problems • Uses everyday language to talk about distance to compare objects and to solve problems • Orders and sequences familiar events • Measures short periods of time in simple ways • Uses everyday language to talk about time to compare and to solve problems	• recognise and name common 2-D and 3-D shapes, including: –2-D shapes [for example, rectangles (including squares), circles and triangles] –3-D shapes [for example, cuboids (including cubes), pyramids and spheres] • compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] • measure and begin to record time (hours, minutes, seconds) • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times
Numbers – Solving problems (sharing) Reception **Number- Fractions Year 1** **1 week**	• Solves problems involving sharing	• recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • connect halves and quarters to the equal sharing and grouping of sets of objects and to measures • recognise and combine halves and quarters as parts of a whole
	Assess and review	

2.15 Maths Teaching Sequences by Class: Class 2

New concepts should always be introduced in a concrete way (see Calculations Policy for further details). Once secure in concrete methods, pictorial representations should be used before finally moving onto abstract methods.

Autumn 1	Year 1	Year 2
Number – Number and place value 2 week	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read & write numbers to 100 • given a number, identify one more/less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • practising ordering [first, second, third]	• recognise the place value of each digit in a two-digit number (tens, ones) • identify, represent and estimate numbers using different representations, including number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • use place value and number facts to solve problems • count in steps of 2 and 5 from 0, forwards and backwards
Number – Addition and subtraction 1 week	• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20. • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ − 9	• recall and use addition and subtraction facts to 20 fluently • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems • solve problems with addition and subtraction: – using concrete objects and pictorial representations, including those involving numbers, quantities and measures – applying their increasing knowledge of mental methods • recall and use addition and subtraction facts and derive and use related facts up to 100
Geometry – Properties of shapes & Measurement (length and height) & Time 2 week	• recognise and name common 2-D shapes, including: – 2-D shapes [for example, rectangles (including squares), circles and triangle.	•order and arrange combinations of mathematical objects in patterns and sequences • use mathematical vocabulary to describe position, direction and movement, including movement in a straight line • identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line • compare and sort common 2-D shapes • draw lines and shapes using a straight edge *
	• compare, describe and solve practical problems for lengths and heights [for example, long/short, longer/shorter, tall/ short, double/half] • measure & begin to record lengths/heights • sequence events in chronological order using language[for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm) to the nearest appropriate unit, using rulers • compare and order lengths and record the results using >, < and
	Assess and review	
Autumn 2	**Year 1**	**Year 2**
Number – Number and place value	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	• count in steps of 2 and 5 from 0, and in tens from any number, forwards and backwards • count in steps of 3 from 0, forwards and backwards

	Year 1	Year 2
Number – Multiplication and division 2 weeks	• count, read and write numbers to 100 in numerals• given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words. • count in multiples of twos, fives and tens	• identify, represent and estimate numbers using different representations, including the number line • compare and order numbers from 0 up to 100; use <, > and = signs • read and write numbers to at least 100 in numerals and in words • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the (×),(÷) &(=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication & division, using materials, arrays, repeated addition, mental methods, & multiplication and division facts.
	• solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • understand multiplication and division through grouping and sharing quantities	
Number – Fractions **1 week**	• recognise, find & name a half as one of two equal parts of an object, shape or quantity • recognise & combine halves as parts of whole	• recognise, find, name and write fractions 1/3, 1,4, 2,4 , and 3,4 of a length, shape, set of objects or quantity • write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2
Number – Addition and subtraction **1 week**	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20. • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ − 9	• solve problems with addition and subtraction: – using concrete objects and pictorial representations, including those involving numbers, quantities and measures – applying their increasing knowledge of mental methods • add and subtract numbers using concrete objects, pictorial representations and mentally, including: – a two-digit number and ones
Measurement (money) & Geometry – Position and direction Plus Statistics Year 2 **1 week**	• recognise and know the value of different denominations of coins and notes	•recognise and use symbols for pounds (£) and pence (p); combine amounts to make a value •find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change
	• describe position, direction and movement, including whole, half, quarter and three-quarter turns	• use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise & anticlockwise) • interpret & construct tally chart/simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data
Measurement - time 1 week	• tell and write the time to half past & hour and draw the hands on a clock face to show these times	• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour
	Assess and review	

As children's understanding deepens teaching will move more to pictorial and abstract representations. However, for those children who still need concrete materials, these should be used as appropriate.

Spring 1	Year 1	Year 2
Number – Addition and subtraction **1 week**	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20.	• solve problems with addition and subtraction: – using concrete objects & pictorial representations, including those with numbers – applying their increasing knowledge of mental methods

	• solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ − 9	• add and subtract numbers using concrete objects, pictorial representations and mentally, including: – a two-digit number and tens – adding three one-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems
Number – Number and place value **Number – Multiplication and division** **2 weeks**	• count in multiples of twos, fives and tens • solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of teacher • understand multiplication & division through grouping & sharing quantities • make connections between arrays, number patterns and counting in twos, fives and tens **	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot
Measurement (capacity/mass /time/money) **2 weeks**	• compare, describe and solve practical problems for capacity and volume [for example, full/empty, more than, less than, quarter] • measure and begin to record capacity and volume • compare, describe and solve practical problems for mass/weight [for example, heavy/light, heavier than, lighter than)] • measure and begin to record mass/weight • recognise & know the value of different of coins and notes • tell and write the time to half past & hour and draw the hands on a clock face to show these times	• choose and use appropriate standard units to estimate and measure capacity (litres/ml) to the nearest appropriate unit, using measuring vessels • compare and order volume/capacity/mass and record the results using >, < and = • compare and order mass and record the results using >, < and = • find different combinations of coins that equal the same amounts of money • solve simple problems in a practical context involving addition & subtraction of money of the same unit, including change • tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times & know the number of minutes in an hour
Geometry – Properties of shapes **1 week**	• recognise and name common 3-D shapes, including: – 3-D shapes [for example cuboids (including cubes), pyramids and spheres)]	• identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. • identify 2-D shapes on the surface of 3-D shapes • compare and sort common 2-D and 3-D shapes and everyday objects
	Assess and review	
Spring 2	**Year 1**	**Year 2**
Number **Number all operations** **2 weeks**	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20. • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ − 9 • add and subtract one-digit and two-digit numbers to 20, including 0 • realise the effect of adding and subtracting zero in order to establish addition and subtraction as related operations	• add and subtract numbers using concrete objects, pictorial representations and mentally, including: – two two-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations • recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs

	• solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of teacher	• show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
Number – Number and place value **1 week**	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals • given a number, identify one more and one less • identify & represent numbers using objects and pictorial representations including the number line, & use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words	• count in steps of 2 and 5 from 0, and in tens from any number, forwards and backwards • count in steps of 3 from 0, forwards and backwards • recognise the place value of each digit in a two-digit number (tens, ones) • compare and order numbers from 0 up to 100; use <, > and = signs • use place value and number facts to solve problems
Number – Fractions **1 week**	• recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • recognise and combine quarters as parts of a whole **	• recognise, find, name and write fractions 1/3, 1,4, 2,4 , and 3,4 of a length, shape, set of objects or quantity • write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2
Measurement (time) Year 1 **Statistics Year 2** **1 week**	• sequence events in chronological order using language[for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] • recognise and use language relating to dates, including days of the week, weeks, months and years • tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	• interpret and construct tally charts and simple tables • ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data
	Assess and review	

Teaching now should be in the main using abstract representations, with emphasis on securing depth of learning and evidence of application across different scenarios and using and applying and problem solving foci. Once again there will be some children who still need to rely on pictorial/concrete examples and pupils should be encouraged to use jottings to support their manipulations and show their understanding.

Summer 1	Year 1	Year 2
Number – Number and place value **1 week**	• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number • count, read and write numbers to 100 in numerals • given a number, identify one more and one less • identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least • read and write numbers from 1 to 20 in numerals and words • recognise place value in numbers beyond 20 **	• count in steps of 2 and 5 from 0, and in tens from any number, forwards and backwards • count in steps of 3 from 0, forwards and backwards • recognise the place value of each digit in a two-digit number (tens, ones) • compare and order numbers from 0 up to 100; use <, > and = signs • use place value and number facts to solve problems
Number – Addition and subtraction **2 weeks**	• read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs • represent and use number bonds and related subtraction facts within 20. • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial	• solve problems with addition and subtraction: – using concrete objects and pictorial representations including those involving numbers, quantities and measures – applying their increasing knowledge of mental and written methods

	Year 1	Year 2
	representations, and missing number problems such as $7 = \square - 9$ • add and subtract one-digit and two-digit numbers to 20, including 0 • realise the effect of adding and subtracting zero in order to establish addition and subtraction as related operations	• add and subtract numbers using concrete objects, pictorial representations and mentally, including: – two two-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations • record addition and subtraction in columns to support place value and prepare for formal written methods with larger numbers
Number – Fractions 1 week	• recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • recognise and combine quarters as parts of a whole **	• recognise, find, name and write fractions 1/3, 1,4, 2,4 , and 3,4 of a length, shape, set of objects or quantity • write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2
Geometry – Position and direction – Year 1 **Statistics Year 2** **1 week**	• describe position, direction and movement, including whole, half, quarter and three-quarter turns	• interpret and construct simple pictograms, block diagrams and simple tables • use many-to-one correspondence in pictograms with simple ratios of 2 *• ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity • ask and answer questions about totalling and comparing categorical data
Measurement **1 week**	• measure and begin to record the following: – lengths, heights , mass/weight, capacity/volume, time	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and =
	Assess and review	
Summer 2	**Year 1**	**Year 2**
Number – Number and place value & Multiplication and division 1 week	• count in multiples of twos, fives and tens • solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • understand multiplication and division through grouping and sharing small quantities ** • make connections between arrays, number patterns and counting in twos, fives and tens **	• count in steps of 2 and 5 from 0, and in tens from any number, forwards and backwards • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
Number – Addition and subtraction **1 week**	• read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • represent and use number bonds and related subtraction facts within 20. • solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$ • add and subtract one-digit and two-digit numbers to 20, including 0	solve problems with addition and subtraction: – using concrete objects and pictorial representations including those involving numbers, quantities and measures – applying their increasing knowledge of mental and written methods • add and subtract numbers using concrete objects, pictorial representations and mentally, including: – two two-digit numbers • show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot • recognise and use the inverse relationship between addition and subtraction and use this to check calculations

		• record addition and subtraction in columns to support place value and prepare for formal written methods with larger numbers *
Number – Multiplication and division **Fractions** **1 week**	• solve one-step problems involving multiplication and division by calculating the answer using concrete objects, pictorial representations and arrays, with the support of the teacher • double numbers and quantities ** • find simple fractions of objects, numbers and quantities ** • recognise, find and name a half as one of two equal parts of an object, shape or quantity • recognise, find and name a quarter as one of four equal parts of an object, shape or quantity • connect halves and quarters to the equal sharing and grouping of sets of objects and to measures ** • recognise and combine halves and quarters as parts of a whole **	• recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs • solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts • recognise, find, name & write fractions 1/3, 1,4, 2,4 , & 3,4 of a length, shape, objects or quantity • write simple fractions for example, ½ of 6 = 3 and recognise the equivalence of 2/4 and 1/2
Measurement (length and height, and mass) **1 week**	• compare, describe and solve practical problems for: – lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] – mass/weight [for example, heavy/light, heavier than, lighter than] • measure and begin to record the following: – lengths and heights – mass/weight	• choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels • compare and order lengths, mass, volume/capacity and record the results using >, < and =• compare and sequence intervals of time
Measurement (time) **1 week**	• compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] • measure and begin to record time (hours, minutes, seconds) • tell the time to the hour & half past the hour & draw the hands on a clock face to show these times	• tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times • know the number of minutes in an hour and the number of hours in a day
	Assess and review	

2.16 Maths Teaching Sequences by Class: Class 3

New concepts should always be introduced in a concrete way (see Calculations Policy for further details). Once secure in concrete methods, pictorial representations should be used before finally moving onto abstract methods.

Autumn 1	Year 3	Year 4
Number and place value **1 week**	Recognise the place value of each digit in a three digit number Find 10 more or less than a given number Compare and order numbers to 1000 Read and write numbers to 1000 in numerals Solve number problems involving these concepts	Find 1000 more or less than a given number Recognise the place value of each digit in a 4 digit number Count in multiples of 6 or 9 Order and compare numbers beyond 1000 Identify, represent and estimate numbers using different representations
Number – Addition and subtraction **2 weeks**	Practise solving varied addition and subtraction questions. Add – Subtract - For mental calculations with two-digit numbers, the answers could exceed 100. * • add and subtract numbers mentally, including: – a three-digit number and ones – a three-digit number and tens • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction	practise mental methods with increasingly large numbers to aid fluency * • add numbers with up to four digits using the formal written method of columnar addition where appropriate • estimate answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why extend understanding of the number system and decimal place value to tenths * • recognise and write decimal equivalents of any number of tenths

		• round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure problems involving decimals to two decimal places
Number – Multiplication and division 2 weeks	• count from 0 in multiples of 4 and 8 • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • multiply two and three-digit numbers by a one-digit number using formal written layout Divide - • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	• count in multiples of 7 • recall multiplication and division facts for multiplication tables up to 12×12 Recognise and use factor pairs and commutativity in mental calculations Count in multiple 25 and 100 • use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations • multiply two-digit numbers by a two-digit number using formal written layout Divide • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit
Measurement – Time 1 week	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks • estimate and read time with increasing accuracy to the nearest minute; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight	convert between different units of measure • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days
	Assess and review	
Autumn 2	**Year 3**	**Year 4**
Number – Fractions and decimals 2 weeks	recognise, find and write fractions of a discrete set of objects: unit and non-unit fractions with small denominators • recognise and use fractions as numbers: unit and non-unit fractions with small denominators • compare and order unit fractions and fractions with the same denominators Add and subtract fractions with the same denominator within one whole • solve problems that involve all of the above recognise and show, using diagrams, equivalent fractions with small denominators	extend the use of the number line to connect fractions, numbers and measures recognise and show, using diagrams, families of common equivalent fractions • understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths * • count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole Number
Decimals 1 week	Objectives Money	extend understanding of the number system and decimal place value to hundredths * • recognise and write decimal equivalents of any number of hundredths • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • compare numbers with the same number of decimal places up to two decimal places
Measurement	measure, compare, add and subtract mass (kg/g)	convert between different units of measure

1 week		• estimate, compare and calculate different measures describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon
Geometry – Properties of shape **1 week**	make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them recognise angles as a property of shape or a description of a turn • identify right angles, recognise that two right angles make a half turn, three make three-quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle	identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry identify acute and obtuse angles and compare and order angles up to two right angles by size
Statistics		
	Assess and review	

As children's understanding deepens teaching will move more to pictorial and abstract representations. However, for those children who still need concrete materials, these should be used as appropriate.

Spring 1	Year 3	Year 4
Number – Number and place value **1 week**	recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas	count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) • order and compare numbers beyond 1000 • round any number to the nearest 10 or 100 • solve number and practical problems that involve all of the above and with increasingly large positive numbers
Number – Addition and Subtraction **2 weeks**	add and subtract numbers mentally, including: – a three-digit number and ones – a three-digit number and tens – a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • add and subtract amounts of money to give change, using both £ and p in practical contexts	practise mental methods with increasingly large numbers to aid fluency * • add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
Number – Multiplication and Division **2 weeks**	count from 0 in multiples of 50 and 100; find 100 more or less than a given number • recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	multiply three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects
Measurement – Length, volume and capacity **1 week**	measure, compare, add and subtract volume/capacity (l/ml) measure, compare, add and subtract lengths (m/cm/mm)	convert between different units of measure • estimate, compare and calculate different measures
	Assess and review	

Spring 2	Year 3	Year 4
Number – Number and place value 1 week	recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • compare and order numbers up to 1000 • identify, represent and estimate numbers using different representations • read and write numbers up to 1000 in numerals and in words • solve number problems and practical problems involving these ideas	count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) • order and compare numbers beyond 1000 • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers • read Roman numerals to 100 (I to C) and know that over time the numeral system changed to include the concept of zero and place value
Number – Addition and subtraction 1 week	solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction • add and subtract amounts of money to give change, using both £ and p in practical contexts	practise mental methods with increasingly large numbers to aid fluency * • subtract numbers with up to four digits using the formal written method of columnar subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why
Number – Fractions 1 week	count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 • recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators • recognise and show, using diagrams, equivalent fractions with small denominators • solve problems that involve all of the above	use factors and multiples to recognise equivalent fractions and simplify where appropriate • recognise and show, using diagrams, families of common equivalent fractions • add and subtract fractions with the same denominator • solve simple measure and money problems involving fractions
Measurement – Perimeter 1 week	Convert between units of length measure the perimeter of simple 2-D shapes	convert between different units of measure measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • relate area to arrays and multiplication
Statistics	interpret and present data using bar charts, pictograms and tables • solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
	Assess and Review	

Teaching now should be in the main using abstract representations, with emphasis on securing depth of learning and evidence of application across different scenarios and using and applying and problem solving foci. Once again there will be some children who still need to rely on pictorial/concrete examples and pupils should be encouraged to use jottings to support their manipulations and show their understanding.

Summer 1	Year 3	Year 4
Number – Addition and Subtraction 2 weeks	add and subtract numbers mentally, including: – a three-digit number and ones – a three-digit number and tens – a three-digit number and hundreds • add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction • estimate the answer to a calculation and use inverse operations to check answers	add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why • estimate, compare and calculate different measures, including money in pounds and pence

	• solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction Add and subtract amounts of money to give change, using both £ and p in practical contexts	
Number – Place value (Y3) **Decimals (Y4)** **1 week**	recognise the place value of each digit in a three-digit number (hundreds, tens, ones) • identify, represent and estimate numbers using different representations Begin to understand place value in decimal numbers • solve number problems and practical problems involving these ideas	extend understanding of the number system and decimal place value to tenths and then hundredths * • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to one quarter, one half, three quarters • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving decimals to two decimal places
Measurement – Time **2 weeks**	tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24- hour clocks • estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight • know the number of seconds in a minute and the number of days in each month, year and leap year • compare durations of events [for example to calculate the time taken by particular events or tasks]	convert between different units of measure • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days
	Review and assess	
Summer 2	**Year 3**	**Year 4**
Number – Multiplication and Division **2 weeks**	write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods Divide • solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects	multiply three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects use place value, known and derived facts to divide mentally, including dividing by 1 • practise to become fluent in the formal written method of short division with exact answers * • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects
Geometry – Properties of shapes **2 weeks**	draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them • identify horizontal and vertical lines and pairs of perpendicular and parallel lines draw 2-D shapes and describe them • recognise angles as a property of shape	identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry identify acute and obtuse angles and compare and order angles up to two right angles by size draw 2-D shapes and describe them recognise angles as a property of shape

		compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Position and direction - describe positions on a 2-D grid as coordinates in the first quadrant • plot specified points and draw sides to complete a given polygon
Statistics **1 week**	interpret and present data using bar charts, pictograms and tables solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs
	Review and assess	

2.17 Maths Teaching Sequences by Class: Class 4

New concepts should always be introduced in a concrete way (see Calculations Policy for further details). Once secure in concrete methods, pictorial representations should be used before finally moving onto abstract methods.

Autumn 1	Year 4	Year 5
Number and place value **1 week**	Find 1000 more or less than a given number Recognise the place value of each digit in a 4 digit number Count in multiples of 6 or 9 Order and compare numbers beyond 1000 Identify, represent and estimate numbers using different representations	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • round any number up to 1 000 000 to the nearest 10, 100 and 1000
Number – **Addition and subtraction** **2 weeks**	practise mental methods with increasingly large numbers to aid fluency * • add numbers with up to four digits using the formal written method of columnar addition where appropriate • estimate answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why extend understanding of the number system and decimal place value to tenths * • recognise and write decimal equivalents of any number of tenths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure problems involving decimals to two decimal places	add and subtract numbers mentally with increasingly large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why add whole numbers with more than four digits, including using formal written methods (columnar addition) • add numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy
Number – **Multiplication and division** **2 weeks**	• count in multiples of 7 • recall multiplication and division facts for multiplication tables up to 12 × 12 Recognise and use factor pairs and commutativity in mental calculations Count in multiple 25 and 100 • use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers • recognise and use factor pairs and commutativity in mental calculations	count in multiples of 6 and 9 • recall multiplication and division facts for multiplication tables up to 12 × 12 • recognise and use factor pairs and commutativity in mental calculations identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • multiply numbers up to four digits by a one-digit number using a formal written method • multiply and divide numbers mentally drawing upon known facts

	• multiply two-digit numbers by a two-digit number using formal written layout Divide • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit	• multiply and divide whole numbers by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • solve problems involving multiplication and division, including using their knowledge of squares and cubes • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19
Measurement – Time **1 week**	convert between different units of measure • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	solve problems involving converting between units of time • use all four operations to solve problems involving measure, including scaling
	Assess and Review	
Autumn 2	**Year 4**	**Year 5**
Number – Fractions and decimals **2 weeks**	extend the use of the number line to connect fractions, numbers and measures recognise and show, using diagrams, families of common equivalent fractions • understand the relation between non-unit fractions and multiplication and division of quantities, with particular emphasis on tenths and hundredths * • count up and down in hundredths; recognise that hundredths arise when dividing an object by 100 and dividing tenths by 10 • solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole Number	compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities * • practise counting forwards and backwards in simple fractions * • recognise and describe linear number sequences, including those involving fractions, and find the term-to-term rule
Decimals **1 week**	extend understanding of the number system and decimal place value to hundredths * • recognise and write decimal equivalents of any number of hundredths • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • compare numbers with the same number of decimal places up to two decimal places	read and write decimal numbers as fractions • round decimals with two decimal places to the nearest whole number and to one decimal place • practise adding decimals, including complements of 1 (for example, $0·83 + 0·17 = 1$) • recognise and describe linear number sequences involving decimals and find the term-to-term rule
Measurement **1 week**	convert between different units of measure • estimate, compare and calculate different measures	convert between different units of metric measure • understand and use approximate equivalences between metric units and common imperial units such as pounds • use all four operations to solve problems involving measure [for example, mass] using decimal notation, including scaling
Geometry – Properties of shape **1 week**	describe positions on a 2-D grid as coordinates in the first quadrant • describe movements between positions as translations of a given unit to the left/right and up/down • plot specified points and draw sides to complete a given polygon identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry	identify, describe and represent the position of a shape following a translation, using the appropriate language, and know that the shape has not changed identify, describe and represent the position of a shape following a reflection, using the appropriate language, and know that the shape has not changed

	identify acute and obtuse angles and compare and order angles up to two right angles by size	
Statistics **1 week**	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables
	Assess and Review	

As children's understanding deepens teaching will move more to pictorial and abstract representations. However, for those children who still need concrete materials, these should be used as appropriate.

Spring 1	Year 4	Year 5
Number – Number and place value **1 week**	count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) • order and compare numbers beyond 1000 • round any number to the nearest 10 or 100 • solve number and practical problems that involve all of the above and with increasingly large positive numbers	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above
Number – Addition and Subtraction **2 weeks**	practise mental methods with increasingly large numbers to aid fluency * • add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	subtract whole numbers with more than four digits, including using formal written methods (columnar subtraction) • subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • practise adding and subtracting decimals, including a mix of whole numbers and decimals *
Number – Multiplication and Division **2 weeks**	multiply three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects	multiply numbers up to four digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign
Measurement – Length, volume and capacity **1 week**	convert between different units of measure • estimate, compare and calculate different measures	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre) • understand and use approximate equivalences between metric units and common imperial units such as inches • use all four operations to solve problems involving measure [for example, length] using decimal notation, including scaling
	Assess and Review	
Spring 2	Year 4	Year 5
Number – Number and place value **1 week**	count backwards through zero to include negative numbers • recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones) • order and compare numbers beyond 1000 • round any number to the nearest 10, 100 or 1000 • solve number and practical problems that involve all of the above and with increasingly large positive numbers	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years

		written in Roman numerals
	• read Roman numerals to 100 (I to C) and know that over time the numeral system changed to include the concept of zero and place value	
Number – Addition and subtraction 1 week	practise mental methods with increasingly large numbers to aid fluency * • subtract numbers with up to four digits using the formal written method of columnar subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why	mentally add and subtract tenths, and one-digit whole numbers and tenths * • practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 [for example, $0.83 + 0.17 = 1$]
Number – Fractions 1 week	use factors and multiples to recognise equivalent fractions and simplify where appropriate • recognise and show, using diagrams, families of common equivalent fractions • add and subtract fractions with the same denominator • solve simple measure and money problems involving fractions	compare and order fractions whose denominators are all multiples of the same number • add and subtract fractions with the same denominator and denominators that are multiples of the same number • recognise and use thousandths and relate them to tenths and hundredths
Measurement – Perimeter 1 week	convert between different units of measure measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres • find the area of rectilinear shapes by counting squares • relate area to arrays and multiplication	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2), and estimate the area of irregular shapes
Statistics 1 week	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables
	Assess and Review	

Teaching now should be in the main using abstract representations, with emphasis on securing depth of learning and evidence of application across different scenarios and using and applying and problem solving foci. Once again there will be some children who still need to rely on pictorial/concrete examples and pupils should be encouraged to use jottings to support their manipulations and show their understanding.

Summer 1	Year 4	Year 5
Number – Addition and Subtraction 2 weeks	add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate • estimate and use inverse operations to check answers to a calculation • solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why • estimate, compare and calculate different measures, including money in pounds and pence	add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling
Number – Fractions and Decimals 2 week Switch with addition and	use factors and multiples to recognise equivalent fractions and simplify where appropriate • recognise and show, using diagrams, families of common equivalent fractions • add and subtract fractions with the same denominator	recognise mixed numbers and improper fractions and convert from one form to the other, and write mathematical statements >1 as a mixed number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams

subtraction this term?? **Percentages – Y5**	• solve simple measure and money problems involving fractions extend understanding of the number system and decimal place value to tenths and then hundredths * • recognise and write decimal equivalents of any number of tenths or hundredths • recognise and write decimal equivalents to one quarter, one half, three quarters • find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths • round decimals with one decimal place to the nearest whole number • compare numbers with the same number of decimal places up to two decimal places • solve simple measure and money problems involving decimals to two decimal places	• connect equivalent fractions >1 that simplify to integers with division, and other fractions >1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions read and write decimal numbers as fractions • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal • solve problems that require knowing percentage and decimal equivalents of half, quarter, fifth, 2-fifths, 4-fifths and those fractions with a denominator of a multiple of 10 or 25 • make connections between percentages, fractions and decimals
Measurement 1 week	convert between different units of measure • read, write and convert time between analogue and digital 12- and 24-hour clocks • solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days	convert between different units of metric measure (for example litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as pints • estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • use all four operations to solve problems involving measure [for example volume] using decimal notation, including scaling
	Assess and Review	
Summer 2	**Year 4**	**Year 5**
Number – Multiplication and Division 2 weeks	multiply three-digit numbers by a one-digit number using formal written layout • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects use place value, known and derived facts to divide mentally, including dividing by 1 • practise to become fluent in the formal written method of short division with exact answers * • solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems, and harder correspondence problems such as n objects are connected to m objects	multiply numbers up to four digits by a two-digit number using a formal written method, including long multiplication for two-digit numbers • divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates multiply and divide numbers mentally drawing upon known facts • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling

Geometry – Properties of shapes 2 weeks	identify lines of symmetry in 2-D shapes presented in different orientations • complete a simple symmetric figure with respect to a specific line of symmetry identify acute and obtuse angles and compare and order angles up to two right angles by size draw 2-D shapes and describe them recognise angles as a property of shape compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes Position and direction - describe positions on a 2-D grid as coordinates in the first quadrant • plot specified points and draw sides to complete a given polygon	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees • identify: – angles at a point and one whole turn (total 360°) – angles at a point on a straight line and 12 a turn (total 180°) – other multiples of 90° use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles • use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems * • use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals * • use conventional markings for parallel lines and right angles
Statistics 1 week	interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs	solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables
	Assess and Review	

2.18 Maths Teaching Sequences by Class: Class 5

New concepts should always be introduced in a concrete way (see Calculations Policy for further details). Once secure in concrete methods, pictorial representations should be used before finally moving onto abstract methods.

Autumn 1	Year 5	Year 6
Number and place value 1 week	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • round any number up to 1 000 000 to the nearest 10, 100 and 1000	read, write, order and compare numbers up to 10 000 000and determine the value of each digit • round any whole number to a required degree of accuracy • solve number and practical problems that involve all of the above use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables
Number – Addition and subtraction 2 week	add and subtract numbers mentally with increasingly large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why add whole numbers with more than four digits, including using formal written methods (columnar addition) • add numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy	perform mental calculations, including with large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction

Number – Multiplication and division 2 weeks	count in multiples of 6 and 9 • recall multiplication and division facts for multiplication tables up to 12 × 12 • recognise and use factor pairs and commutativity in mental calculations identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers • multiply numbers up to four digits by a one-digit number using a formal written method • multiply and divide numbers mentally drawing upon known facts • multiply and divide whole numbers by 10, 100 and 1000 • recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3) • solve problems involving multiplication and division, including using their knowledge of squares and cubes • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers • establish whether a number up to 100 is prime and recall prime numbers up to 19	practise multiplication for larger numbers, using the formal written methods of short and long multiplication * • perform mental calculations, including with large numbers • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations practise division for larger numbers, using the formal written method of short division • divide numbers up to four digits by a two-digit number using the formal written method of short division where appropriate • perform mental calculations, including with large numbers • identify common factors, common multiples and prime numbers
Measurement – Time 1 week	solve problems involving converting between units of time • use all four operations to solve problems involving measure, including scaling	use, read, write and convert between standard units, converting measurements of time from a smaller unit of measure to a larger unit, and vice versa
	Assess and review	
Autumn 2	**Year 5**	**Year 6**
Number – Fractions and decimals 2 weeks	compare and order fractions whose denominators are all multiples of the same number • identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths • develop their understanding of fractions as numbers, measures and operators by finding fractions of numbers and quantities * • practise counting forwards and backwards in simple fractions * • recognise and describe linear number sequences, including those involving fractions, and find the term-to-term rule	use common factors to simplify fractions; use common multiples to express fractions in the same denomination • compare and order fractions, including fractions >1 • add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions associate a fraction with division and calculate decimal fraction equivalents [for example, 0·375] for a simple fraction and use equivalences between simple fractions, decimals and percentages • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
Decimals 1 week	read and write decimal numbers as fractions • round decimals with two decimal places to the nearest whole number and to one decimal place • practise adding decimals, including complements of 1 (for example, 0·83 + 0·17 = 1) • recognise and describe linear number sequences involving decimals and find the term-to-term rule	identify the value of each digit in numbers given to three decimal places, and multiply and divide numbers by 10, 100 and 1000 giving the answers up to three decimal places • multiply decimals by whole numbers, starting with the simplest cases, such as 0·4 × 2 = 0·8, and in practical contexts, such as measures and money • solve problems that require answers to be rounded to specified degrees of accuracy multiply one-digit numbers with up to two decimal places by whole numbers • multiply numbers with up to two decimal places by one digit whole numbers
Measurement 1 week	convert between different units of metric measure	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate

	• understand and use approximate equivalences between metric units and common imperial units such as pounds • use all four operations to solve problems involving measure [for example, mass] using decimal notation, including scaling	• use, read, write and convert between standard units of metric measurement • convert between miles and kilometres
Geometry – Properties of shape 1 week	identify, describe and represent the position of a shape following a translation, using the appropriate language, and know that the shape has not changed identify, describe and represent the position of a shape following a reflection, using the appropriate language, and know that the shape has not changed	recognise, describe and build simple 3-D shapes, including making nets describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes draw 2-D shapes using given dimensions and angles • compare and classify geometric shapes based on their properties and sizes, and find unknown angles in any triangles, quadrilaterals and regular polygons • recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles
Statistics	solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables	interpret and construct pie charts and line graphs and use these to solve problems • draw graphs relating two variables * • calculate and interpret the mean as an average
Assess and review		

As children's understanding deepens teaching will move more to pictorial and abstract representations. However, for those children who still need concrete materials, these should be used as appropriate.

Spring 1	Year 5	Year 6
Number – Number and place value 1 week	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above	Use negative numbers in context, and calculate intervals across zero perform mental calculations, including with mixed operations and large numbers read, write, order and compare numbers up to 10 000 000and determine the value of each digit • round any whole number to a required degree of accuracy • solve number and practical problems that involve all of the above use simple formulae • generate and describe linear number sequences • express missing number problems algebraically • find pairs of numbers that satisfy an equation with two unknowns • enumerate possibilities of combinations of two variables
Number – Addition and Subtraction 2 weeks	subtract whole numbers with more than four digits, including using formal written methods (columnar subtraction) • subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • practise adding and subtracting decimals, including a mix of whole numbers and decimals *	perform mental calculations, including with large numbers • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction • use their knowledge of the order of operations to carry out calculations involving the four operations • practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction
Number – Multiplication and Division	multiply numbers up to four digits by a one- or two-digit number using a formal written method,	Perform mental calculations practise multiplication for larger numbers, using the formal written method of long multiplication *

2 weeks	including long multiplication for two-digit numbers divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign	• multiply multi-digit numbers up to four digits by a two-digit whole number using the formal written method of long multiplication practise division for larger numbers, using the formal written method of long division • perform mental calculations, including large numbers and decimals • use estimation to check answers to calculations multiply decimals by whole numbers, starting with the simplest cases, such as $0·4 \times 2 = 0·8$, and in practical contexts, such as measures and money *
Measurement – Length, volume and capacity **1 week** **Y6 Shape**	convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre) • understand and use approximate equivalences between metric units and common imperial units such as inches • use all four operations to solve problems involving measure [for example, length] using decimal notation, including scaling	draw shapes accurately, using measuring tools and conventional markings and labels for lines and angles * • illustrate and name parts of circles, including radius, diameter and circumference, and know that the diameter is twice the radius

<div align="center">Assess and review</div>

Spring 2	**Year 5**	**Year 6**
Number – Number and place value **1 week**	read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit • count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 • round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000 • solve number problems and practical problems that involve all of the above • read Roman numerals to 1000 (M) and recognise years written in Roman numerals	recognise proportionality in contexts when the relations between quantities are in the same ratio [for example, similar shapes and recipes] • solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts • consolidate understanding of ratio when comparing quantities, sizes and scale drawings by solving a variety of problems * • solve problems involving similar shapes where the scale factor is known or can be found • solve problems involving unequal sharing and grouping using knowledge of fractions and multiples
Number – Addition and subtraction **1 week**	mentally add and subtract tenths, and one-digit whole numbers and tenths * • practise adding and subtracting decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1 [for example, $0·83 + 0·17 = 1$]	perform mental calculations, including large numbers • practise addition and subtraction for larger numbers, using the formal written methods of columnar addition and subtraction * • use knowledge of the order of operations to carry out calculations involving the four operations • solve problems involving addition, subtraction, multiplication and division • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
Number – Fractions **1 week**	compare and order fractions whose denominators are all multiples of the same number • add and subtract fractions with the same denominator and denominators that are multiples of the same number • recognise and use thousandths and relate them to tenths and hundredths	use common factors to simplify fractions; use common multiples to express fractions in the same denomination • add and subtract fractions with different denominators and mixed numbers using the concept of equivalent fractions • multiply simple pairs of proper fractions, writing the answer in its simplest form • divide proper fractions by whole numbers
Measurement – Perimeter **1 week**	measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres • calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm2) and square metres (m2), and estimate the area of irregular shapes	recognise that shapes with the same areas can have different perimeters and vice versa • recognise when it is possible to use formulae for area of shapes • calculate the area of parallelograms and triangles Revision of geometry: properties of shapes, position and direction
FDPRP **1 week**	read and write decimal numbers as fractions	use written division methods in cases where the answer has up to two decimal places

	• round decimals with two decimal places to the nearest whole number and to one decimal place • practise adding decimals, including complements of 1 (for example, 0·83 + 0·17 = 1) • recognise and describe linear number sequences involving decimals and find the term-to-term rule compare and order fractions whose denominators are all multiples of the same number • add and subtract fractions with the same denominator and denominators that are multiples of the same number • recognise and use thousandths and relate them to tenths and hundredths	• divide numbers with up to two decimal places by one-digit and two-digit whole numbers fraction equivalents [for example, 0·375] for a simple fraction and use equivalences between simple fractions, decimals and percentages • solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison
Statistics 1 week	solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables	interpret and construct pie charts and line graphs and use these to solve problems • draw graphs relating two variables * • calculate and interpret the mean as an average
	Assess and review	

Teaching now should be in the main using abstract representations, with emphasis on securing depth of learning and evidence of application across different scenarios and using and applying and problem solving foci. Once again there will be some children who still need to rely on pictorial/concrete examples and pupils should be encouraged to use jottings to support their manipulations and show their understanding.

Summer 1	**Year 5**	**Year 6**
Number – Addition and Subtraction 2 weeks	add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction) • add and subtract numbers mentally with increasingly large numbers • use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy • solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling	Revision of areas in preparation for NC tests including 4 rules, number and its properties
Number – Fractions and Decimals 2 week **Percentages – Y5**	recognise mixed numbers and improper fractions and convert from one form to the other, and write mathematical statements >1 as a mixed number • multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams • connect equivalent fractions >1 that simplify to integers with division, and other fractions >1 to division with remainders, using the number line and other models, and hence move from these to improper and mixed fractions read and write decimal numbers as fractions • recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents • round decimals with two decimal places to the nearest whole number and to one decimal place • read, write, order and compare numbers with up to three decimal places • solve problems involving number up to three decimal places recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and	Revision of areas in preparation for NC tests including FDPRP

	write percentages as a fraction with denominator 100, and as a decimal • solve problems that require knowing percentage and decimal equivalents of half, quarter, fifth, 2-fifths, 4-fifths and those fractions with a denominator of a multiple of 10 or 25 • make connections between percentages, fractions and decimals	
Shape, space and measures review		Revision of areas including Measurement, geometry: properties of shapes, position and direction
Measurement 1 week	convert between different units of metric measure (for example litre and millilitre) • understand and use approximate equivalences between metric units and common imperial units such as pints • estimate volume [for example, using 1 cm3 blocks to build cuboids (including cubes)] and capacity [for example, using water] • use all four operations to solve problems involving measure [for example volume] using decimal notation, including scaling	solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate • use, read, write and convert between standard units, converting measurements of volume from a smaller unit of measure to a larger unit, and vice versa, using decimal notation up to three decimal places • recognise when it is possible to use formulae for volume of shapes • calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm3) and cubic metres (m3), and extending to other units
Summer 2	**Year 5**	**Year 6**
Number – Multiplication and Division 2 weeks	multiply numbers up to four digits by a two-digit number using a formal written method, including long multiplication for two-digit numbers • divide numbers up to four digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context • solve problems involving addition, subtraction, multiplication and division, and a combination of these, including understanding the meaning of the equals sign • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates multiply and divide numbers mentally drawing upon known facts • multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 • solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates use all four operations to solve problems involving measure [for example, money] using decimal notation, including scaling	perform mental calculations, including with mixed operations and large numbers • use their knowledge of the order of operations to carry out calculations involving the four operations • solve problems involving addition, subtraction, multiplication and division multiply multi-digit numbers up to four digits by a two digit whole number using the formal written method of long multiplication • divide numbers up to four digits by a two-digit whole number using the formal written method of long division • divide numbers up to four digits by a two-digit number using the formal written method of short division where appropriate • perform mental calculations • identify common factors and common multiples • solve problems involving addition, subtraction, multiplication and division • solve problems that require answers to be rounded to specified degrees of accuracy • use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy
Geometry – Properties of shapes 2 weeks	know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles • draw given angles, and measure them in degrees (°) • identify: – angles at a point and one whole turn (total 360°) – angles at a point on a straight line and 12 a turn (total 180°) – other multiples of 90° use the properties of rectangles to deduce related facts and find missing lengths and angles • distinguish between regular and irregular polygons based on reasoning about equal sides and angles	describe positions on the full coordinate grid (all four quadrants) • draw and translate simple shapes on the coordinate plane, and reflect them in the axes • draw and label rectangles (including squares), parallelograms and rhombuses, specified by coordinates in the four quadrants, predicting missing coordinates using the properties of shapes

		• use angle sum facts and other properties to make deductions about missing angles and relate these to missing number problems * • use the term diagonal and make conjectures about the angles formed between sides, and between diagonals and parallel sides, and other properties of quadrilaterals * • use conventional markings for parallel lines and right angles	
		Assess and review	

2.19 Teaching of Times Tables

The 2014 Maths Curriculum placed greater emphasis on the acquisition of all times tables' facts by the end of Year 4. As a result of this and the planned introduction of formal Times Table Testing during 2020 the opportunity has been taken to review approaches to the teaching of times tables.

As we know there is no easy shortcut to the acquisition of table knowledge although it is accepted that some children seem to pick up the facts more easily and some children are more willing to put in the extra effort at home in order to acquire those skills.

Recent initiatives in school have sought to increase the profile of mental maths acquisition and include certificates of achievement in worship and inter class and inter team competitions on TT Rockstars. These initiatives have gone some way in driving up performance but now we need to take the next step and drive performance even further.

On this basis it is recommended that we trial a standard approach to the teaching of times tables. This will include:

- A recommended sequence of the order in which times tables are introduced from Year 1 – 4 (see attached).
- Weekly bespoke Times Tables teaching (which may or may not be part of the mental starter of a lesson).
- Weekly times tables' homework, supported by an appropriate test.
- TT Rockstars activities set weekly in Classes 2 upwards with continued competitions (perhaps allocated to one of the early morning slots).
- From the beginning of Year 4, fortnightly tests in line with the statutory tests.

It is acknowledged that not all children will progress at the same pace and that for some children catch up will continue well into Year 5 and 6.

The following pages identify a suggested sequence of teaching and suitable resources to use. Many experts still believe the chanting or singing of tables to be beneficial but also that the 2x table is the key table to learn properly as it is often the first one children are faced with and securing that is crucial to moving onto other tables.

Hanging Heaton C of E (VC) J & I School – Key Stage 1 sequence for teaching times tables

	Year 1	Year 2
Autumn 1	Count in 2's up to 24, linking with even numbers and supporting doubles. Count in multiples of 10 in order up to 120.	Consolidate counting in steps of 2, 5 and 10 in order from 0 up to 12x.
Autumn 2	Count in 2's up to 24, linking with even numbers and supporting doubles. Count in multiples of 10 in order up to 120.	Count in steps of 2 and 5 from 0 up to 12x fluently. Recall multiples of 10 up to 12x10 in any order, including missing numbers and related division facts with growing fluency.
Spring 1	Focus on counting in multiples of 5 up to 60, linking with knowledge of counting in 10s. Continue to develop fluency of counting in 2's and 10's.	Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts. ***Understanding of 2s critical to all other tables*** Recall multiples of 10 up to 12x10 fluently.
Spring 2	Focus on counting in multiples of 5 up to 60, linking with knowledge of counting in 10s. Continue to develop fluency of counting in 2's and 10's.	Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts. Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts with growing fluency.
Summer 1	Count in multiples of 10, 2 and 5 in order with growing fluency.	Count in multiples of 3 to 12x3 in order from 0. Recall multiples of 2 up to 12x2 in any order, including missing numbers and related division facts fluently. Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts with growing fluency.
Summer 2	Count in multiples of 10, 2 and 5 in order fluently.	Count in multiples of 3 to 12x3 in order from 0 with growing fluency. Recall multiples of 5 up to 12x5 in any order, including missing numbers and related division facts fluently.
Teaching methodologies	• Sing counting songs • Hundred square • Number lines • Count pairs of objects • Count straws bundled in tens • Pictorial representations on display • Rolling numbers or alternative (chanting songs)	• Counting objects in groups of 2, 5, 10 & 3 • Sing counting songs • Hundred square • Number lines • Array with concrete resources • Pictorial representations on display • Rolling numbers or alternative (chanting songs)

Hanging Heaton C of E (VC) J & I School – Key Stage 2 sequence for teaching times tables

	Year 3	Year 4	Year 5
AUT 1	Count in multiples of 3 to 12x3 in order from 0 fluently.	Recall multiples of 3,4 and 8 up to 12x in any order, including missing numbers and related division facts fluently. Fluently count in 6's in order up to 12x6, using multiples of 3	Recall multiples of 12 in any order, including missing numbers and related division facts fluently. Recall multiples of all times tables up to 12x12 in any order, including missing numbers and related division facts with growing fluency
AUT 2	Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts with growing fluency. Count in multiples of 4 to 12x4 in order from 0 with growing fluency. Introduce (relating to x4) and begin to count in multiples of 8 from 0 to 12x8.	Recall multiples of 6 in any order, including missing numbers and related division facts with growing fluency. Fluently count in 7's in order up to 12x7.	
SPR 1	Recall multiples of 3 up to 12x3 in any order, including missing numbers and related division facts fluently. Count in multiples of 4 to 12x4 in order from 0 with fluently. Count in multiples of 8 to 12x8 in order from 0 with growing fluency.	Recall multiples of 6 in any order, including missing numbers and related division facts fluently. Recall multiples of 7 in any order, including missing numbers and related division facts with growing fluency.	**Teaching Methodologies** Year 3 • Counting objects in groups of 3, 4 and 8
SPR 2	Recall multiples of 4 up to 12x4 in any order, including missing numbers & related division facts with growing fluency. Count in multiples of 8 to 12x8 in order from 0 fluently.	Recall multiples of 7 in any order, including missing numbers and related division facts fluently. Fluently count in 9's in order up to 12x9. Fluently count in 11's in order up to 12x11.	• Hundred square • Number lines • Array with concrete resources • Pictorial representations on display • Rolling Numbers or alternative (chanting songs).
SUM 1	Recall multiples of 4 up to 12x4 in any order, including missing numbers and related division facts fluently. Recall multiples of 8 up to 12x8 in any order, including missing numbers & related division facts with growing fluency.	Recall multiples of 9 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by 1 group to find 9x as a strategy) Recall multiples of 11 in any order, including missing numbers and related division facts fluently. Fluently count in 12's in order up to 12x12.	Year 4 • Hundred square • Number lines
SUM 2	Recall multiples of 8 up to 12x8 in any order, including missing numbers and related division facts fluently.	Recall multiples of 9 in any order, including missing numbers and related division facts fluently. Recall multiples of 12 in any order, including missing numbers and related division facts with growing fluency (using 10x and adjusting by adding 2 more groups).	• Pictorial representations on display • Rolling Numbers or alternative (chanting songs).

2.20 Calculation Policy

Our aim: To develop a curriculum which develops lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. Our Calculation Policy has been written in order to deliver the National Curriculum for mathematics which aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- 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.

Our calculation policy incorporates the concept of Concrete, Pictorial, Abstract (CPA) which is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils and involves use of a number of manipulatives to support understanding and enables learners to demonstrate conceptual variation where mathematical concepts are displayed in a variety of ways. Use of manipulatives to be used at all stages of learning can be found in the following pages. Specific details of what is taught in each year group can be found in the Progression Maps by area, however where a child requires additional time on one approach this should be encouraged.

Our sequence of teaching enables us to revisit topics regularly and to build on prior learning. With this in mind, and to ensure learning is completely embedded and understood, it is recommended that learning should always start with an opportunity to demonstrate the Concrete method, although it is recognised that older children may not need to spend the same amount of time on the Concrete stage as younger ones. Use the opportunity to evidence this learning by taking photos and including them in Maths books.
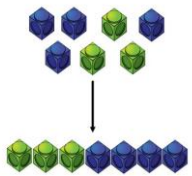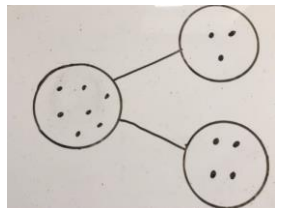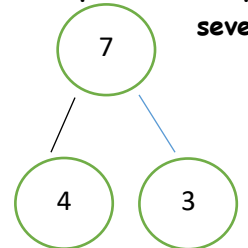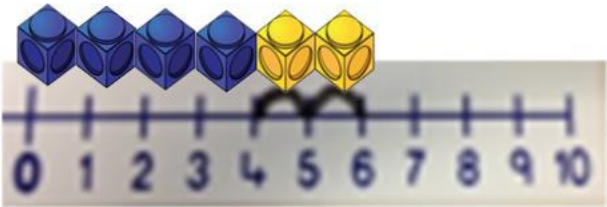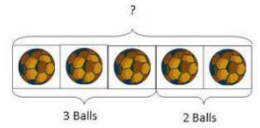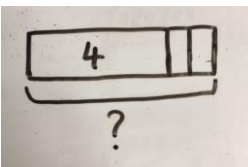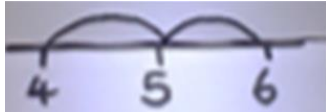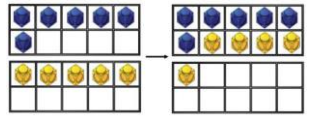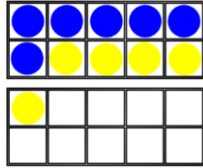
Although you must of course meet the needs of your class both ways and if you think they are ready for, e.g. Abstract earlier or need Concrete later than so be it and of course it is assumed that once this approach is embedded then as children are familiar with the concept then as children move through school less time will be spent on Concrete and more on Abstract and beyond.

Hanging Heaton C of E (VC) J & I School - Use of manipulatives
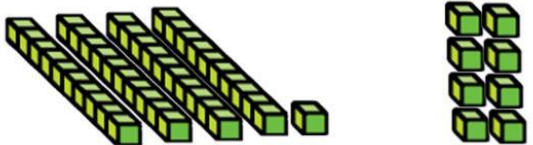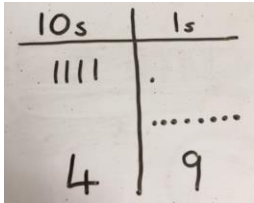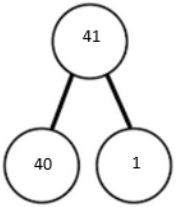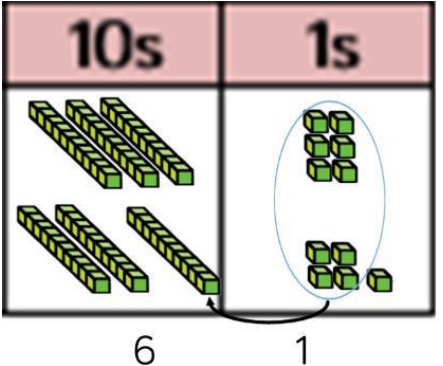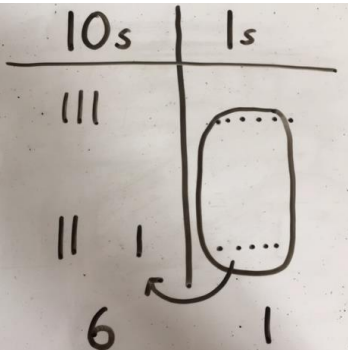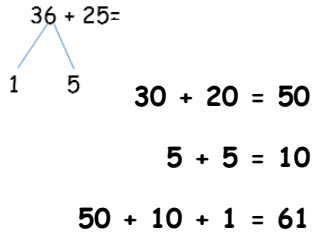
	EYFS/Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Addition	Combining two parts to make a whole: part whole model. Starting at the bigger number and counting on- using cubes or pegs on coat hangers. Regrouping to make 10 using ten frame.	Adding three single digits. Use of base 10 to combine two numbers.	Column method- regrouping. Using place value counters (up to 3 digits).	Column method- regrouping. (up to 4 digits)	Column method- regrouping. Use of place value counters for adding decimals.	Column method- regrouping. Abstract methods. Place value counters to be used for adding decimal numbers.
Subtraction	Taking away ones Counting back Find the difference Part whole model Make 10 using the ten frame	Counting back Find the difference – counting on using a number line. Part whole model Make 10 Use of base 10	Column method with regrouping. (up to 3 digits using place value counters)	Column method with regrouping. (up to 4 digits)	Column method with regrouping. Abstract for whole numbers. Start with place value counters for decimals	Column method with regrouping. Abstract methods. Place value counters for decimals- with different amounts of decimal places.
Multiplication	Recognising and making equal groups. Doubling Counting in multiples Use cubes and other objects in the classroom	Arrays- showing commutative multiplication	Arrays 2d × 1d using base 10 Grid method	Column multiplication- introduced with place value counters. (2 and 3 digit multiplied by 1 digit) Grid method	Column multiplication Abstract only but might need a repeat of year 4 first(up to 4 digit numbers multiplied by 1 or 2 digits)	Column
Division	Sharing objects into groups Division as grouping e.g. I have 12 sweets and put them in groups of 3, how many groups? Use cubes and draw round 3 cubes at a time.	Division as grouping Division within arrays- linking to multiplication Repeated subtraction	Division with a remainder-using lollipop sticks, times tables facts and repeated subtraction. 2d divided by 1d using base 10 or place value counters	Division with a remainder Short division (up to 3 digits by 1 digit- concrete and pictorial)	Short division (up to 4 digits by a 1 digit number including remainders)	Short division Long division with place value counters (up to 4 digits by a 2 digit number) Children should exchange into the tenths and hundredths column too

Calculation policy: Addition
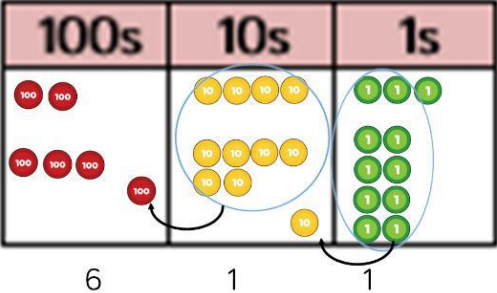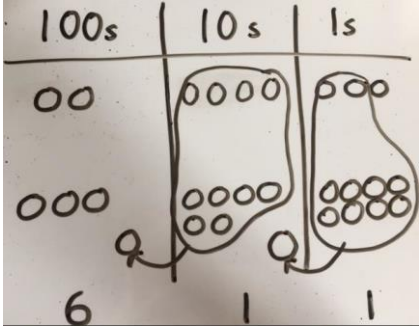
Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to' 'is the same as'.

Concrete	Pictorial	Abstract
Combining two parts to make a whole (use other resources too e.g. eggs, shells, teddy bears, cars).	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too.	$4 + 3 = 7$ Four is a part, 3 is a part and the whole is seven.
Counting on using number lines using cubes. Or use pegs on a coat hanger.	A bar model which encourages the children to count on, rather than count all. Or use a numberline start at the larger number on the number line and count on in ones or in one jump to find the answer. Develop to counting on in H's T's and U's $543+243 = 543 + 200 + 40 + 3$	The abstract number line: What is 2 more than 4? What is the sum of 2 and 4? What is the total of 4 and 2? $4 + 2$ Place the larger number in your head & count on the smaller number to find your answer.
Regrouping to make 10; using ten frames and counters/cubes. $6 + 5$	Children to draw the ten frame and counters/cubes.	Children to develop an understanding of equality e.g. $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
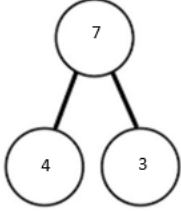
Addition

Concrete	Pictorial	Abstract
TO + O using base 10. Continue to develop understanding of partitioning and place value. 41 + 8 	Children to represent the base 10 e.g. lines for tens and dot/crosses for ones. 	 41 + 8 1 + 8 = 9 40 + 9 = 49
TO + TO using base 10. Continue to develop understanding of partitioning and place value. 36 + 25 	Children to represent the base 10 in a place value chart. 	Looking for ways to make 10. $36 + 25 =$ 1 5 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61 36 +25 61 1 Formal method:

Addition

Concrete	Pictorial	Abstract
Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred.	Children to represent the counters in a place value chart, circling when they make an exchange.	243 $+368$ 611 $1\ 1$ Start by partitioning the numbers before moving on to clearly show the exchange below the addition. $20 + 5$ $40 + 8$ $60 + 13 = 73$ As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here. 72.8 $+54.6$ 127.4 $1\ 1$

Conceptual variation; different ways to ask children to solve 21 + 34

	Word problems: In year 3, there are 21 children and in year 4, there are 34 children. How many children in total? 21 + 34 = 55. Prove it	21 $+34$ ____ 21 + 34 = = 21 + 34 Calculate the sum of twenty-one and thirty-four.	Missing digit problems:
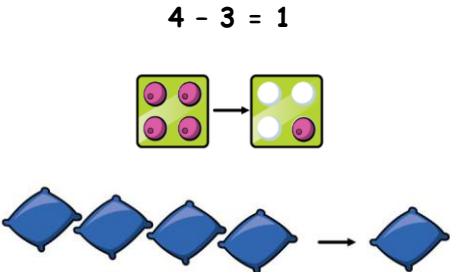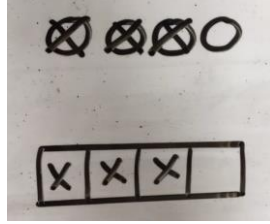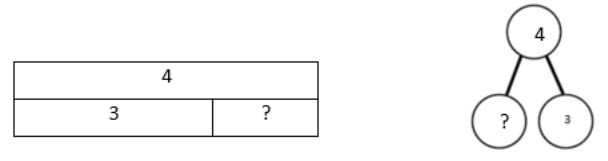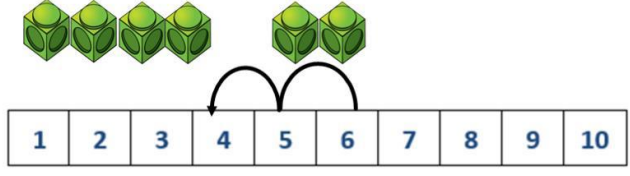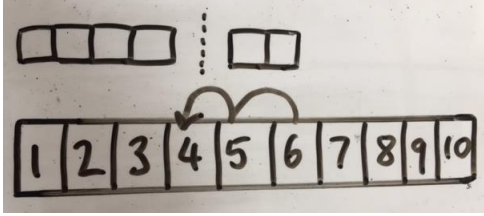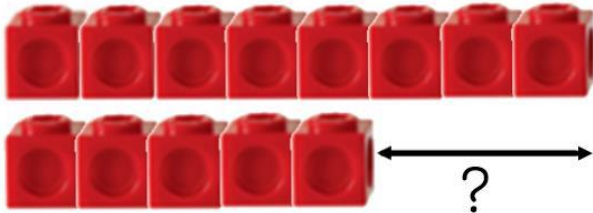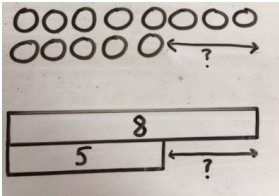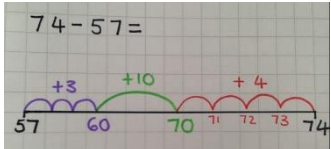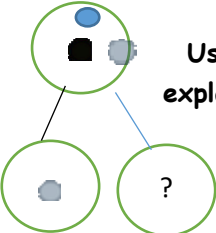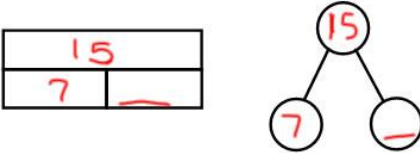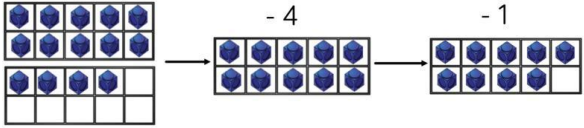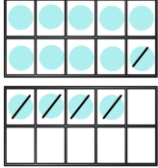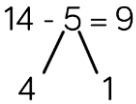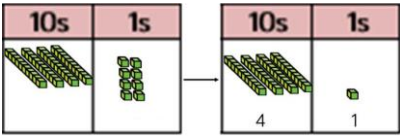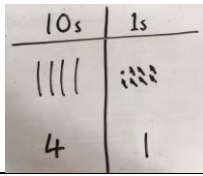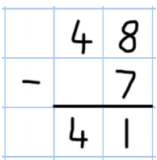
Calculation policy: Subtraction

Key language: take away, less than, the difference, subtract, minus, fewer, decrease.
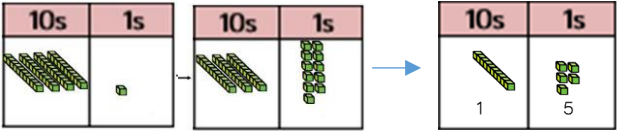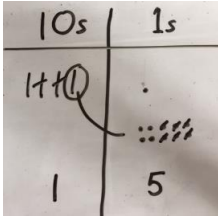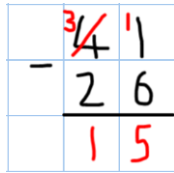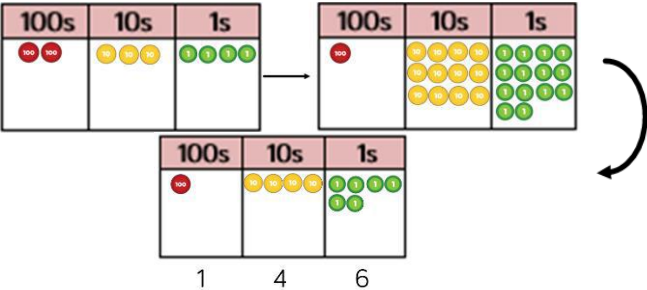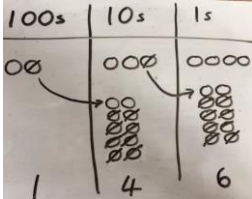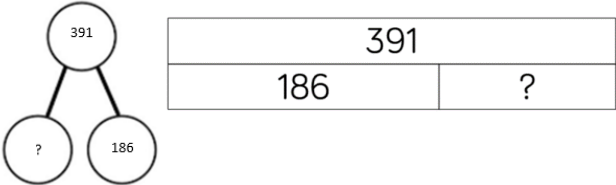
Concrete	Pictorial	Abstract
Physically taking away and removing objects from a whole (ten frames, cubes and other items such as beanbags could be used). 4 – 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	4- 3 =? ? = 4 – 3 18 -3= 15 8 – 2 = 6
Counting back (using number lines, number tracks, or pegs on coat hangers) children start with 6 and count back 2. 6 – 2 = 	 Children to represent what they see pictorially	Put 13 in your head, count back 4. What number are you at? Use your fingers to help. Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line

Subtraction

Concrete	Pictorial	Abstract
Finding the difference (using cubes or Base 10, other objects can also be used).	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. **Count on to find the difference.** $74-57=$	**Find the difference between 8 and 5.** 8 – 5, the difference is ? Children to explore why 9 - 6 = 8 – 5 = 7 – 4 have the same difference. Hannah has 23 sandwiches, Helen has 15 sandwiches. Find the difference between the numbers of sandwiches.
Missing number calculations. Use the part whole model to help explain the inverse between addition and subtraction.	If 15 is the whole and 7 is one of the parts. What is the other part? 15 - 7 = Using a drawn PPW with marks in it	
Making 10 using ten frames. 14 – 5	Children to present the ten frame pictorially and discuss what they did to make 10.	Children to show how they can make 10 by partitioning the subtrahend. $14 - 5 = 9$ 4 1 14-4= 10 10 – 1 = 9
Column method using base 10. 48-7 =	Children to represent the base 10 pictorially.	Column method or children could count back 7.
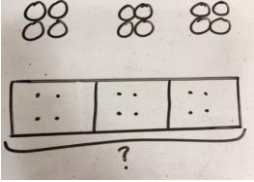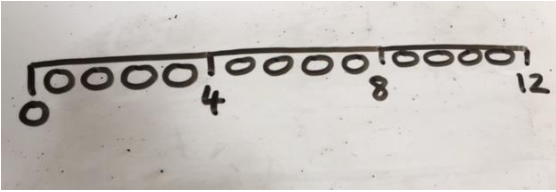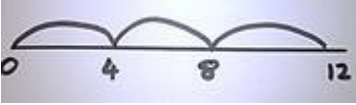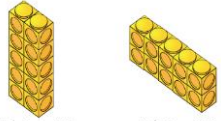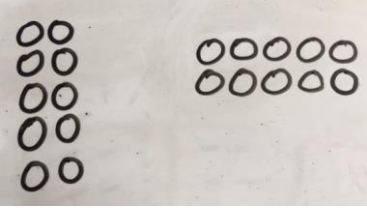
Subtraction

Concrete	Pictorial	Abstract
Column method using base 10 and having to exchange. - 41 – 26 =	Represent the base 10 pictorially, remembering to show the exchange.	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11.
Column method using place value counters.234 – 88=	Represent the place value counters pictorially; remembering to show what has been exchanged.	Formal column method. Children must understand what has happened when they have crossed out digits. $$2\overset{2}{\cancel{3}}\overset{1}{4}$$ $$-\ \ 88$$ $$146$$

Conceptual variation; different ways to ask children to solve 391 - 186

	Raj spent £391, Timmy spent £186. How much more did Raj spend? Calculate the difference between 391 and 186.	? – 391 = 186 What is 186 less than 391? $$391$$ $$-186$$	Missing digit calculations
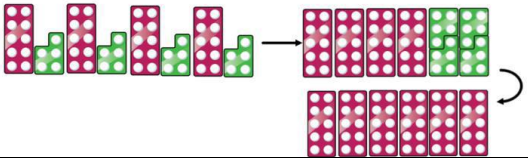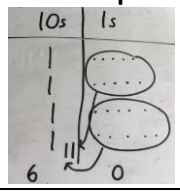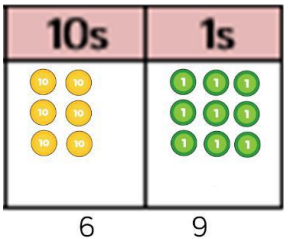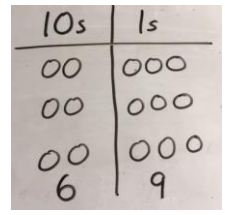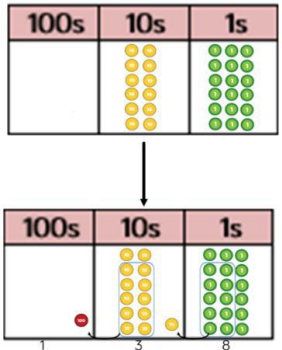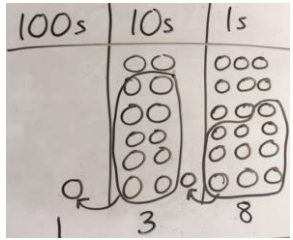
Calculation policy: Multiplication

Key language: double, times, multiplied by, the product of, groups of, lots of, equal groups.

Concrete	Pictorial	Abstract
Repeated grouping/repeated addition 3 × 4 4 + 4 + 4 **There are 3 equal groups, with 4 in each group.** 	**Children to represent the practical resources in a picture and use a bar model.** 	3 × 4 = 12 4 + 4 + 4 = 12
Number lines to show repeated groups- 3 × 4 	**Represent this pictorially alongside a number line e.g.:** 	Abstract number line showing three jumps of four. 3 × 4 = 12
Use arrays to illustrate commutativity counters and other objects can also be used. 2 × 5 = 5 × 2 2 lots of 5 5 lots of 2	**Children to represent the arrays pictorially.** 	Children to be able to use an array to write a range of calculations e.g. 10 = 2 × 5 5 × 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5

Multiplication
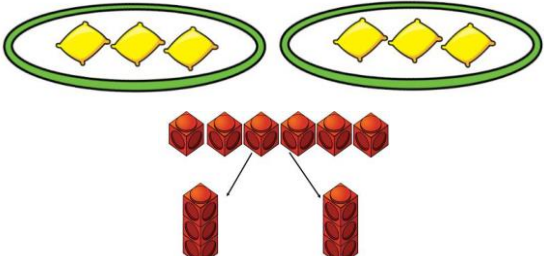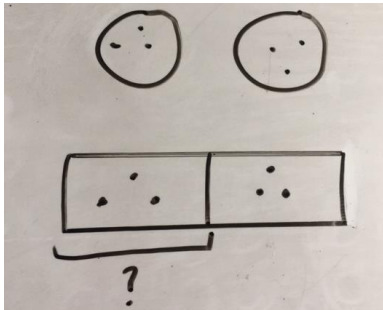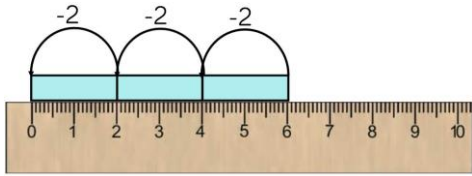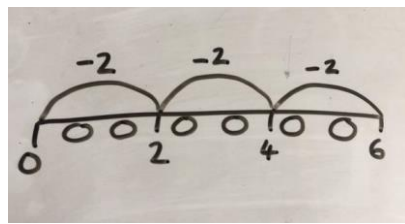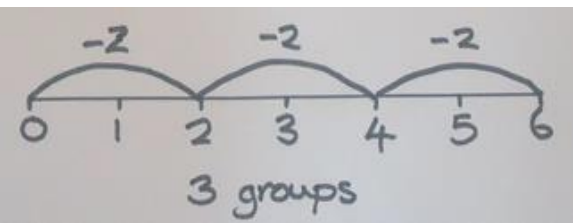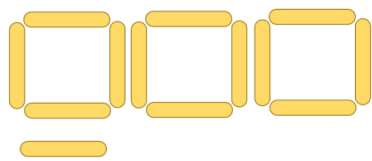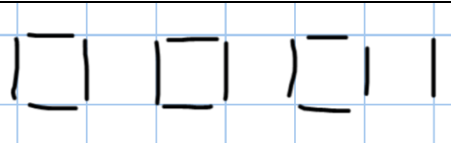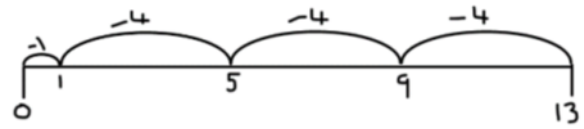
Concrete	Pictorial	Abstract
Partition to multiply using base 10 4 × 15 = 	Children to represent the concrete manipulatives pictorially. 	4 x 15 10 5 Children to be encouraged to show the steps they have taken. A number line can also be used 10 x 4 = 40 5 x 4 = 20 40 + 20 = 60
Formal column method with place value counters (base 10 can also be used.) 3 × 23 	Children to represent the counters pictorially. 	Children to record what it is they are doing to show understanding by grid method With this: 23 x 3 = 69 | X	20	3
---	----	---
3	60	9 | 60 + 9 = 69
Formal column method with place value counters. 6 x 23 	Children to represent the counters/base 10, pictorially e.g. the image below. 	Formal written method 6 x 23 = 23 × 6 138 1 1

Multiplication
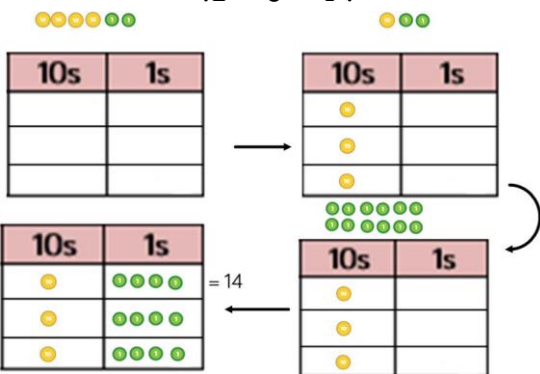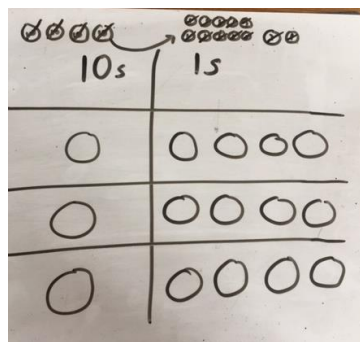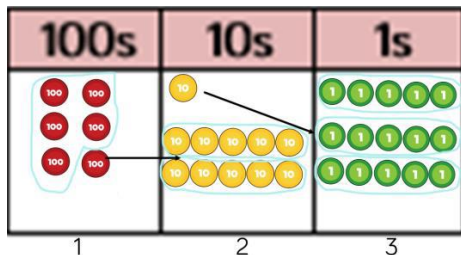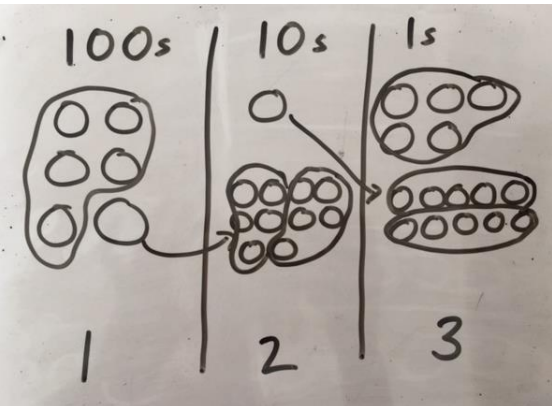
Concrete	Pictorial	Abstract
When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract: To get 744 children have solved 6 × 124. To get 2480 they have solved 20 × 124.		$$\begin{array}{ccc} & 1 & 2 & 4 \\ \times & & 2 & 6 \\ \hline & {}_{1}7 & {}_{2}4 & 4 \\ 2 & {}^{-}4 & 8 & 0 \\ \hline 3 & 2 & 2 & 4 \\ & 1 & 1 \end{array}$$ Answer: 3224

Conceptual variation; different ways to ask children to solve 6 × 23			
  23 23 23 23 23 23 ?	Mai had to swim 23 lengths, 6 times a week. How many lengths did she swim in one week? With the counters, prove that 6 × 23 = 138	Find the product of 6 and 23 6 × 23 = ? = 6 × 23 $$\begin{array}{r} 6 \\ \times\ 23 \\ \hline \end{array} \qquad \begin{array}{r} 23 \\ \times\ 6 \\ \hline \end{array}$$	What is the calculation? What is the product?

Calculation policy: Division

Key language: share, group, divide, divided by, half.

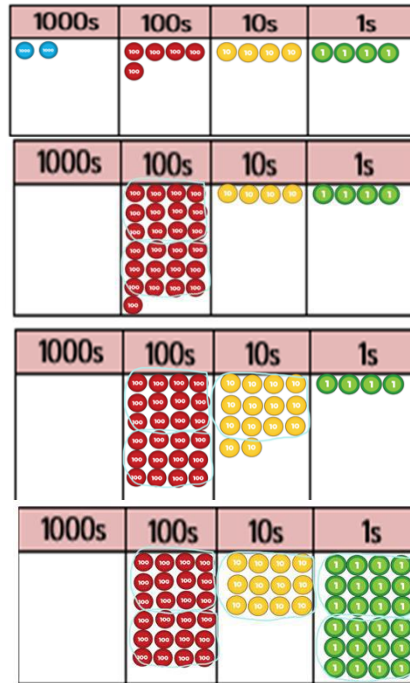| Concrete	Pictorial	Abstract
Sharing using a range of objects. **6 ÷ 2** 	**Represent the sharing pictorially.** 	$6 ÷ 2 = 3$ Children should also be encouraged to use their 2 times table's facts.
Repeated subtraction using base 10 or cubes above a ruler. 6 ÷ 2 3 groups of 2	**Children to represent repeated subtraction pictorially.** 	**Abstract number line to represent the equal groups that have been subtracted.** 3 groups
2d ÷ 1d with remainders using lollipop sticks. **13 ÷ 4** **Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.** There are 3 whole squares, with 1 left over. 	 **Children to represent the lollipop sticks pictorially.** There are 3 whole squares, with 1 left over.	**13 ÷ 4 – 3 remainder 1** Children should be encouraged to use their times table facts; they could also represent repeated addition on a number line '3 groups of 4, with 1 left over'

Division

Concrete	Pictorial	Abstract
Sharing using place value counters. 42 ÷ 3 = 14 	Children to represent the place value counters pictorially. 	Children to be able to make sense of the place value counters and write calculations to show the process. 42 ÷ 3 42 = 30 + 12 30 ÷ 3 = 10 12 ÷ 3 = 4 10 + 4 = 14
Short division using place value counters to group. 615 ÷ 5 1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones?	Represent the place value counters pictorially. 	Children to the calculation using the short division scaffold. $$\begin{array}{r} 123 \\ 5\overline{)6^{1}1^{1}5} \end{array}$$

Division

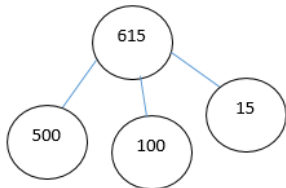| Concrete	Pictorial	Abstract
Long division using place value counters - 2544 ÷ 12	We can't group 2 thousands into groups of 12 so will exchange them.	
	We can group 24 hundreds into groups of 12 which leaves with 1 hundred.	
	After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.	
	After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.	

Conceptual variation; different ways to ask children to solve 615 ÷ 5

Using the part whole model below, how can you divide 615 by 5 without using short division?	**I have £615 and share it equally between 5 bank accounts. How much will be in each account?** **615 pupils need to be put into 5 groups. How many will be in each group?**	$5 \overline{)615}$ $615 ÷ 5 =$ $= 615 ÷ 5$	**What is the calculation?** **What is the answer?**