Mayflower FEDERATION

Mathematics Year 1 Spring Term

Block 1 Place Value	
Step 1 Count within 20	In the Autumn term, children learnt the numbers to 10. In this small step, they extend that learning to count to 20 Provide regular opportunities for children to verbally count to 20, for example counting how many children are present or how many beanbags there are in a bucket. Children can find counting through the teen numbers difficult, as the number names do not have the same regular 1 to 9 pattern that they hear once they count beyond 20. Use concrete resources to support children to see the "10-and-a-bit" structure of teen numbers. Number tracks can support children in counting on and back to 20. "I count, you count" activities allow children to practise continuing the count from different starting points.
Step 2 Understand 10	In this small step, children develop their understanding of 10. A deep understanding of 10 will set children up well for future learning. Use ten frames, bead strings and towers of cubes to draw attention to the fact that 10 ones and 1 ten are equivalent. Ten frames, bead strings and regular patterns, such as those on a dice, can support children to instantly recognise (subitise) 10 without needing to count. Spend time looking at 10 in different ways, particularly ways where the 10 can be fixed or broken apart, for example a bundle of 10 straws. Children could then move on to seeing 10 as one base 10 piece that cannot be broken apart, although the individual ones are still obvious
Step 3 Understand 11, 12, 13	In this small step, children develop their understanding of 11, 12 and 13 as 1 ten and some ones, or "10-and-a-bit". Start by showing children 10 on a ten frame and explore with them how to use a second ten frame to extend the number represented to 11, 12 and 13 Encourage them to make 11, 12 and 13 using a range of resources that make the "10-and-a-bit" structure clear. Ten frames, number pieces, towers of cubes, Rekenreks and bead strings all support children to see the full ten and part of the next ten to support their place value understanding. This understanding is crucial to future work on addition and subtraction. Time should be taken to ensure that children understand the difference between the digits in the numbers, making links between the tens and ones in the representation and the numeral.
Step 4 Understand 14, 15, 16	In this small step, children extend the learning of the previous step by looking at 14, 15 and 16 Children practise matching numbers to representations using cards showing 14, 15 and 16 in words and numerals alongside representations of each number. As with the previous step, encourage children to make 14, 15 and 16 using a range of resources that make the "10-and-a-bit" structure clear. Ten frames, number pieces, towers of cubes, Rekenreks and bead strings all support children to see the full ten and part of the next ten to support their place value understanding. This understanding is crucial to future work on addition and subtraction. Children should be challenged to explore the differences and similarities between these numbers and 11, 12 and 13. They also use part-whole models, giving them an informal introduction to partitioning.
Step 5 Understand 17, 18, 19	In this small step, children extend the learning of the previous two steps by looking at 17, 18 and 19 Children explore 17, 18 and 19 shown on ten frames, expressing them as 1 ten and a number of ones. Encourage children to notice the "10-and-a bit" structure to help them subitise as they have done previously. Children practise matching numbers to representations using cards showing 17, 18 and 19 in words and numerals alongside representations of each number. Ten frames, number pieces, towers of cubes, Rekenreks and bead strings continue to support children to see the full ten and part of the next ten to support their place value understanding. This understanding is crucial to future work on addition and subtraction. Now that children are looking at the later teen numbers, encourage them to see the number of empty spaces in the second ten frame in order to quickly identify 17, 18 and 19.

Step 6 Understand 20	In this small step, children apply what they have learnt about 10, to develop an understanding of 20. A deep understanding of 20 will set children up well for future learning. Use ten frames, bead strings and towers of cubes to draw attention to the fact that 2 tens are equivalent to 20. Spend time looking at 20 in different ways, particularly ways where each ten can be fixed or broken apart, for example bundles of straws. Children could then move on to seeing 20 as two base 10 pieces that cannot be broken apart, although the individual ones are still obvious.
Step 7 1 more, 1 less	In this small step, children apply their counting skills to find 1 more and 1 less than any number within 20 Children have already looked at this concept for numbers within 10, so while the focus here is on numbers from 11 to 20, other numbers within 20 can also be covered. Ensure that examples involving zero are used, for example 1 less than 1 is zero and 1 more than zero is 1. Children have already encountered the language of "more" and "less", but this may need reinforcing. Using real-life examples, such as "1 more grape", will help children with their understanding of the vocabulary. Representations such as ten frames are useful for showing 1 more and 1 less. Towers of cubes are particularly useful for clearly showing the 1 more pattern of consecutive numbers. Using a number track alongside concrete resources can help children develop a secure understanding of the concept. Children practise finding 1 more and 1 less using both representations and numerals
Step 8 The number line to 20	Children learnt about the number line to 10 in the Autumn term. In this small step, they extend the number line to 20 All the number lines in this step count in 1s. Children can use number lines to practise and consolidate the skills learnt so far in this block. They recap counting from 0 to 20 forwards when labelling a number line and practise counting backwards when reading from right to left. A number line is a great opportunity to count from zero, as children do not do this when counting physical things. They use a variety of number lines all counting in 1s, but with different start and end point values.
Step 9 Use a number line to 20	In this small step, children build on their understanding of the number line to 20 All the number lines in this step count in 1s. Children continue to use the number line to practise and consolidate the skills learnt so far in this block. Children see that 1 more is the next number along the number line, while 1 less is the previous number. They identify all the numbers lying between two given numbers and work out and label numbers on partially labelled number lines.
Step 10 Estimate on a number line to 20	In this small step, children are asked to estimate for the first time. This is a new word for children to learn. Previously, they may have been asked to "guess" and make predictions. When children are beginning to estimate on a number line, take time to explore the halfway point. Where do they think halfway is? How do they know? What informal measurements could they use to check? (For example, steps in the playground.) Some children may initially struggle to estimate. Conversations with other children are vital to develop understanding. Some children may find not having an exact answer difficult and need time to grasp the idea of estimating. Children need to be confident using a number line before being able to estimate. For example, if they are estimating where 4 is on a blank number line from zero to 10, they need to be able to reason that it will be less than halfway.
Step 11 Compare numbers to 20	In this small step, children build on their understanding of comparing numbers from the Autumn term to compare pairs of numbers up to and including 20 Children can use their knowledge of counting to support them. For example, because they say 16 after 15, they know that 16 is greater than 15. They can also use their knowledge of representing numbers using objects to help them identify which number in a pair is greater or less than the other. Ten frames and number lines are useful representations to support children when comparing numbers. Both the inequality symbols and the language of "greater than", "less than" and "equal to" are used throughout. It is important that children see examples of all the symbols, to reinforce their meaning. Children also compare numbers written as words.
Step 12 Order numbers to 20	Now that children are confident in counting and comparing numbers to 20, in this small step they move on to ordering sets of three numbers. Expose children to different methods for ordering such as comparing two groups initially and lining groups up. Children should use the language they used in the previous step as well as "greatest", "smallest", "most" and "fewest". Children need to apply their knowledge of tens and ones to help them work abstractly. For example, when ordering 8, 17 and 14 children should recognise that 8 is the only number that does not have 1 ten, therefore 8 is the smallest of the three numbers

Block 2 Addition and Subtraction	
Step 1 Add by counting on within 20	In this small step, children build on their learning from earlier in the year as they explore addition by counting on from a given number within 20 The use of ten frames and counters or cubes is particularly useful, together with bar models. Children should begin to understand that addition is commutative (although they do not need to formally know the word), and that it is more efficient to start from the greater number than the smaller number. For example, when working out 1 + 13, it is quicker to add 1 to 13 than to add 13 to 1. A number line is a particularly useful tool to exemplify this point, as children see the benefit of drawing just 1 jump rather than drawing 13 jumps. It is important that children see that they are not just counting the total of two separate numbers or items; rather, they are adding to what they already have.
Step 2 Adding ones using number bonds	In this small step, children use number bonds and related facts when adding within 20, as an alternative to counting on. This is a more efficient method because, for example, if they know that 4 and 2 are a bond to 6, they can use this fact to see that 14 and 2 are a bond to 16, as are 4 and 12 Using counters and ten frames and base 10 enables children to see the links between related facts, noticing that, for example, 11 + 6 is 10 more than 1 + 6 Children can also explore missing number problems such as 5 + = 17 using the knowledge that 5 and 2 are a number bond to 7
Step 3 Find and make number bonds to 20	In this small step, children explore number bonds to 20. They have already learnt about number bonds to 10 and should be confident with these. It is essential that children are fluent in their number bonds as they are used frequently throughout the curriculum. Children use their knowledge of number bonds to 10 to find number bonds to 20. Using examples such as 7 + 3, 17 + 3 and 7 + 13 encourages children to see the link between bonds to 10 and bonds to 20, as well as reinforcing their understanding of place value. They see that working systematically helps them to find all the possible number bonds to 20 Representations such as ten frames, counters, Rekenreks and part-whole models, among others, can be used to support children's understanding.
Step 4 Doubles	In this small step, children learn about doubles, with a focus on adding the two equal quantities together as opposed to multiplying by 2 Give children opportunities to build doubles using real objects and mathematical equipment. Building numbers using the pair-wise patterns on ten frames helps them to see the doubles. Mirrors and barrier games are a fun way for children to see doubles as they build and begin to explore symmetry. Encourage children to say the doubles as they build them, for example "Double 2 is 4" Provide examples of doubles and non-doubles for children to sort and explain why they have sorted in the way they have. Dominoes are a great resource for this activity. At this point, children only explore doubles up to double 10
Step 5 Near doubles	Building on the previous step, in this small step children use doubles to help work out near doubles. For example, they can use the double fact that 6 + 6 = 12 to work out 6 + 7 by adding 1 more. They should see that this is a more efficient method than counting on. As in the previous step, building numbers in a pair-wise pattern on ten frames can help children visualise that to work out 3 + 4, they can do 3 + 3 plus 1 more. Children can also explore finding near doubles through subtraction, for example 3 + 4 is equal to 4 + 4 minus 1. This can be useful for children who are more confident with certain doubles than others. For example, if a child is not confident with doubling 7, they may struggle with 7 + 8, but if they can double 8, they can use this fact instead.
Step 6 Subtract ones using number bonds	In this small step, children begin subtracting within 20. Earlier in the year, children subtracted within 10 by counting back and using number lines. They now subtract within 20 using their knowledge of number bonds. For example, if they know the number bond 7 – 5 = 2, then they know that 17 – 5 = 12 By completing these calculations side by side using ten frames, counters, part-whole models or base 10, children see that the second subtraction will have an answer that is 10 greater than the first subtraction. At this stage, none of the subtractions cross 10, so children can focus on using their number bond knowledge rather than counting back, which is covered in the next step.
Step 7 Subtracting- counting back	In this small step, children build on the language of subtraction, recognising the subtraction symbol from earlier learning and using it within 20 Children use the counting back strategy for numbers within 20, including subtractions that cross 10. The use of zero is important, so children know that when nothing is taken away, the start number remains the same, or when the whole group is taken away, there will be nothing left. Crossing out and using a number line are particularly useful for counting back to work out subtractions. This can also be linked with "first, then, now" stories.

Step 8 Subtraction- finding the difference	In this small step, children build on the language of subtraction, recognising the subtraction symbol from earlier learning and using it within 20 Children use the counting back strategy for numbers within 20, including subtractions that cross 10. The use of zero is important, so children know that when nothing is taken away, the start number remains the same, or when the whole group is taken away, there will be nothing left. Crossing out and using a number line are particularly useful for counting back to work out subtractions. This can also be linked with "first, then, now" stories.
Step 9 Related facts	Now that children have spent some time exploring addition and subtraction separately, in this small step they look at how they relate to each other, considering the addition and subtraction fact families for numbers within 20 Children use both concrete resources and pictures to find links between the addition and subtraction sentences. Highlight that addition and subtraction are inverse operations. As well as finding the four related facts, children can write the sentences with the "=" at either the end or the start. Throughout this step, the idea of commutativity should be reinforced, and children should be able to verbalise that addition can be done in any order, whereas subtraction cannot. It is not necessary for children to use the word "commutative" at this stage.
Step 10 Missing number problems	In this final small step, children explore missing number problems. They use the idea of inverse operations to see that if they start with a number and add 2 to it, then to "undo" that they need to subtract 2. Bar models and part-whole models are useful representations for this. "First, then, now" stories can be particularly helpful for children to act out the problems and visualise what is happening. Use of counters and ten frames, as well as number lines, supports children in their understanding of a missing number problem, helping them to discuss what the numbers in a problem represent. With the missing number problem 3 + = 5, a common mistake is to add 3 and 5 and get 3 + 8 = 5. Children need to spot that this does not make sense, as 8 is greater than 5
Block 3 Place Value (within 50)	
Step 1 Count from 20 to 50	In this small step, children count forwards and backwards between 20 and 50 Chanting games, such as "I count, you count", give children the opportunity to count from different starting points alongside their peers. Number tracks and half-hundred squares are useful representations to support children counting up to 50. When counting on a half-hundred square, ensure that they recognise the convention of moving to the next row after reaching a multiple of 10
Step 2 20, 30, 40, 50	In this small step, children develop their understanding of multiples of 10 up to 50 Recap learning from Spring Block 1 about the equivalence of 10 ones and 1 ten using representations such as a ten frame or a bundle of 10 straws. There are several representations that can be used in this step to highlight how many tens are in each number, for example ten frames, base 10, bead strings and towers of cubes. Give children practical opportunities to explore each number in different ways using a range of concrete resources. Children could move on to seeing e.g. 20 as two base 10 pieces that cannot be broken apart, although the individual ones are still obvious.
Step 3 Count by making groups of tens	In this small step, children learn how to count objects more efficiently by grouping into tens and ones. Children should spend time practically counting groups of ten from objects such as counters, cubes and straws. Building towers of 10 cubes or bundling 10 straws will reinforce the concept of 1 ten being equal to 10 ones. After grouping objects into tens practically, children practise counting pictures of objects and circling each group of ten. It is important that children recognise that a 2-digit number is formed by counting the number of groups of ten for the first digit and the ones left over as the second digit.
Step 4 Groups of tens and ones	This small step consolidates children's place value understanding of tens and ones. Children continue to describe a number by the number of tens and ones the number is made from. Learning from the previous step is extended, as the representations of the tens and ones are not always in place value order. Children need to count the number of groups of 10 and then the ones to find the total. All the representations still show that 10 ones make 1 ten, and children could still count individual ones to find the total. However, this is not efficient, so if children are still doing this, encourage them to recognise the groups of 10. Using base 10 is useful, as it gives children no option other than to count tens and ones, since they cannot split the ten apart.
Step 5	In this small step, children develop their understanding of place value for 2-digit numbers as they begin to partition numbers to 50. They have already explored how many tens and ones make a number and they now use a part-whole model to partition a number into tens and ones. Children first

Partitioning into tens and ones	investigate partitioning with representations, followed by numbers. It is important that they see that the whole can be partitioned into tens and ones or ones and tens. The value of the whole and each part does not change in either order. At this stage, children do not need to describe the part-whole model as an addition number sentence.
Step 6 The number line to 50	Children have used a number line to count to 10 and 20 in previous blocks; in this small step, the number line is extended to include numbers to 50 Encourage children to explore the similarities and differences between a number track and a number line. There are lots of opportunities for practical activities within this step, such as children creating their own number line on the playground. Children see examples of number lines with different start and end point values, as well as number lines between zero and 50 or between multiples of 10. They use their knowledge of counting to label number lines counting up in 1s before labelling number lines counting in 10s. Building on this, they find the position of given numbers on unlabelled number lines.
Step 7 Estimate on and number line to 50	Building on the previous small step, children estimate the positions of numbers on number lines up to 50 Children have estimated on number lines to 20, but they may need to recap the idea of an estimate being a "best guess". Remind them that estimates are not exact. Explore the process of finding a midpoint on a blank number line by asking what number is halfway between the start and end point numbers. Discuss how that makes it easier to estimate the position of a number. After finding the midpoint, children can then position the number using proportional reasoning.
Step 8 1 more, 1 less	In this final step, children apply their counting skills to find 1 more and 1 less than any number between zero and 50. They have already found 1 more and 1 less than numbers within 20 in a previous block. As children are still developing their understanding of 2-digit numbers, it is important that they find 1 more and 1 less of a number using concrete resources and representations. Initially, they could make a number using a ten frame and counters, before working out 1 more and 1 less by adding or removing counters. Children could then use number lines alongside concrete resources to count forwards or backwards.
Length and height	
Step 1 Compare lengths and heights	In this small step, children compare lengths and heights of objects using language such as "longer than", "shorter than" and "taller than". Children understand that height is a type of length and that the language they use changes, depending on what type of length they are describing and comparing. Children should also be exposed to objects that have the same length or height and use the language of "is the same" or "is equal to" to compare. At this stage, children only compare the lengths and heights of pairs of objects. Ordering lengths and heights is covered later in Key Stage 1.
Step 2 Measure length using objects	In this small step, children begin to measure the lengths and heights of objects, using non-standard units of measure such as cubes or paper clips. As in the previous step, they explore both lengths and heights. It is important that children know that in order to measure the length of something they need to use a consistent unit of measure. They should see that it is not useful to measure the length of something using a range of objects, for example a combination of cubes and paper clips. Similarly, the chosen unit of measure should be equal in size, for example all the paper clips must be the same. Learning from the previous step is consolidated, as children make comparisons of lengths they have measured. They should see that for accurate comparisons they must use a consistent unit of measure, for example cubes for both items
Step 3 Measure length in centimetres	Building on the previous step, children measure the lengths and heights of objects using a ruler and a standard unit of measure: centimetres. They are introduced to the abbreviation "cm", so that they do not have to write the full word. Discuss with children why it is helpful to have a standard unit of measure that can be used around the world. Model how to align a ruler with the object being measured. Also show how to look to the nearest whole centimetre when measuring objects that are not an exact number of centimetres. Learning from the first step is consolidated, as children make comparisons of lengths they have measured.
Mass and Volume	
Step 1 Heavier and lighter	In this block, children are formally introduced to mass for the first time. They may have some understanding of describing something as heavy or light from their own experience or from previous learning in Reception. Children begin by holding objects to compare them, using the language of "heavier" or "lighter". They then use balance scales to check their comparisons. They need to understand that the heavier object is lower on the balance scale. At this stage, children do not need to measure the actual mass of objects in order to compare them. Children may assume that larger objects are heavier than

	smaller objects or that objects that are the same size/shape have the same mass. Comparing the mass of a large inflated balloon and a small ball of modelling clay, and comparing the mass of an inflated and a water-filled balloon should help to overcome these misconceptions.
Step 2 Measure mass	In this small step, children use a variety of non-standard units, such as cubes or bricks, to measure the mass of an object. Building on the previous step, children should understand that when a scale is balanced, objects have the same mass. On a balanced scale, the number of non-standard units on one side tells them the mass of the object on the other side. Highlight the importance of choosing the same non-standard unit to measure the mass. Measuring the mass of an object using an assortment of different non-standard units, such as a number of cubes, pencils and wooden bricks, makes it difficult to record the object's mass. Children may find it difficult to balance objects exactly. If an object does not balance exactly, encourage them to use the closest number or to try a different non-standard unit.
Step 3 Compare mass	In this small step, children compare the masses of two objects, still using non-standard units of measure. Children should know that if, for example, an apple has the same mass as 6 cubes and a banana has the same mass as 4 cubes, then the apple is heavier than the banana, provided the cubes have the same mass. Children use their knowledge of "heavier" and "lighter" from earlier in the block to compare the masses of objects. It is important that children are also exposed to examples of objects that have the same mass as each other. Once children are confident comparing two objects, they can begin to order the masses of more than two objects and to use the language of "heaviest" and "lightest".
Step 4 Full and empty	In this small step, children are introduced to volume and capacity for the first time. They begin by exploring practically the idea that capacity is the maximum amount that something can hold. Ensure that they experience a range of different sizes and shapes of containers and begin to make basic comparisons to see which has the greater capacity. Children then explore the concept that volume is the amount of something inside a container. They describe the volume in a container using phrases such as "empty", "nearly empty", "nearly full" and "full". At this stage, no formal measurements of volume or capacity, such as litres, are used.
Step 5 Compare volume	In this small step, children develop their understanding of volume further and start to compare volumes using the language of "more than" and "less than". Initially, children make simple visual comparisons between identical containers, using the language introduced in the previous step. They should still be exposed to a range of different size and shape containers. Children then compare and order more than two glasses. This can include following instructions to show a certain volume, for example showing more than half full, but less than nearly full. Challenge children to also compare volumes in containers with different capacities. For example, if glasses are the same height but different widths and the level of the water is the same, then the wider glass must have a greater volume of water inside. Practical explorations of these types of problems will be key.
Step 6 Measure capacity	In this small step, children measure the capacity of different containers using non-standard units of measure. They formalise their understanding that the capacity of a container is how much of something it can hold. This can be cups of water or sand, cubes or marbles and so on. Show children that to measure the capacity of a container, they need to make sure that the unit of measure remains the same, for example the same size of marble or the same size of cup. They also need to see that to accurately measure the capacity of a container, they must fill the container to the top. Discuss different non-standard units of measure, and how some are more accurate than others. For example, cups of water and sand are more accurate than cubes or marbles because they take up more of the space in the container.
Step 7 Compare capacity	In this small step, children compare the capacities of different containers, still using non-standard units of measurement. Children recognise that if container A has a capacity of 3 cups of water and container B can hold more than 3 cups of water, then container B has a greater capacity than container A. They then move on to using inequality symbols to record this. It is important that children know that the units of measure need to be the same for both containers in order to compare capacities. Remind them of the importance of filling each container to the top. Finally, children compare more than two containers, putting them in either ascending or descending order of capacity.