MATHEMATICS -RECEPTION

"Without mathematics, there's nothing you can do. Everything around you is mathematics. Everything around you is numbers." Shakuntala Devi.

"There should be no such thing as boring mathematics." Edsger W. Dijkstra.

Maths should not only be taught during specific maths sessions but wherever possible throughout the day. The following should be utilised to support maths teaching:

- Days of the week song and talking about the day
- General counting e.g. counting how many bananas there are in the fruit box.
- Do we have more bananas or more apples? Do we have fewer apples or bananas? (children can use their subitsting skills)
- Subitising and using fingers to represent
- Counting songs and rhymes, using fingers to represent
- Use of ordinal numbers e.g. "Iyla line up first, Gurnoor line up second…"
- Ordering numbers to 10/20 and beyond.
- Using ten frames for self-registration
- Maths games such as track counting games
- Noticing maths in the environment e.g. asking children what they notice about a tree. They may say it is tall, has circles on, notice the pattern in the bark etc.
- Incorporating maths in areas of continuous provision.
- Incorporating maths in daily routines e.g. during registration time. If there are 3 children absent the children clap 3 times. Having labels on pencil pots with a representation of a number to show how many pencils go in that pot during tidy up time. Different representations of number on the 'how many children can play here' posters.
- Time – this will not be discretely taught, it will be weaved throughout the day and week. Find opportunities to discuss daily routine and class timetable, using language of time to describe when events happen e.g. day, night, morning, afternoon, before, after, today, tomorrow. As a class measure time in simple ways e.g. counting the number of sleeps until an important event or using timers.

The Five Counting Principles

The one-one principle. This involves children assigning one number name to each object that is being counted. Children need to ensure that they count each object only once ensuring they have counted every object.	**The stable-order principle.** Children understand when counting, the numbers have to be said in a certain order.	**The cardinal principles.** Children understand that the number name assigned to the final object in a group is the total number of objects in that group.	**The abstraction principle.** This involves children understanding that anything can be counted including things that cannot be touched including sounds and movements e.g. jumps.	**The order-irrelevance principle.** This involves children understanding that the order we count a group of objects is irrelevant. There will still be the same number.

Key Language for Teachers

Cardinal – The number that indicates how many there are in a set.	**Classification** – The identification of an object by specific attributes, such as colour, texture, shape or size.
Conservation (of number) – The recognition that the number stays the same if none have been added or taken away.	**Numeral** – The written symbol for a number; e.g. 3, 2, 1
Ordinal – a number denoting the position in a sequence e.g. 1st, 2nd, 3rd, etc or page 1, page 2, page 3...	**Partition** – separate a set into two or more subsets e.g. partition a set of socks into plain and patterned.
Subitise – Instantly recognise a small quantity, without having to count how many there are.	**Number** – Number can be: • a count of a collection of items e.g. three boxes, • a measure e.g. of length or weight, or • a label e.g. the number 17 bus
More and less; more than and less than Used when talking about the number e.g. 2 is less than 4.	**More and fewer; more than and fewer than** Used when talking about an amount of objects
Quantity –The amount you have of something e.g. a cup of flour, three boxes, half an hour	

Six Key Areas of Early Mathematics Learning

There are six main areas that collectively underpin children's early mathematical learning, and which provide the firm foundations for the maths that children will encounter as they progress through primary school.

They are:

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

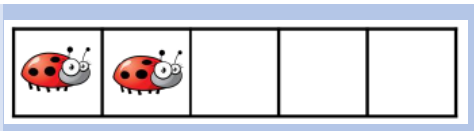
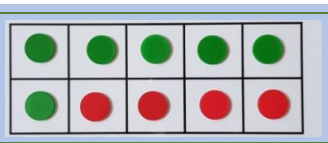
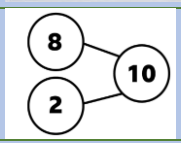
Composition: understanding that one number can be made up from (composed from) two or more smaller numbers

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

Measures: comparing different aspects such as length, weight and volume, as a preliminary to using units to compare later.

Key Representations

Five Frames	
Ten Frames	
Part Whole	
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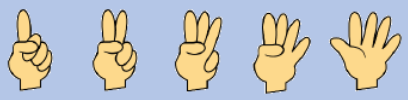
Fingers	
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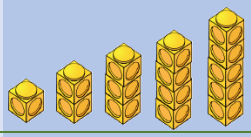
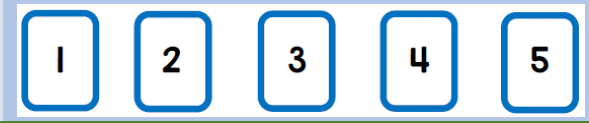
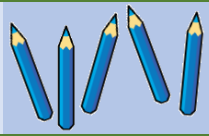
Dominoes	
Cubes	
Numerals	
Real life objects	
Numberblocks	
Drawing	

Autumn Term

	Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7	Block 8	Block 9
2 weeks	2 weeks	2 weeks	1 week	2 weeks	1 week	1 week	3 weeks	1 week	1 week
Baseline	Comparison	Measures	Pattern	Number	Shape and Space	Shape and Space	Number	Shape and Space	Measures

Spring Term

Block 1	Block 2	Block 3	Block 4	Block 5	Block 6	Block 7
2 weeks	1 week	2 weeks	2 weeks	3 weeks	1 weeks	1 week
Number	Measures	Number	Measures	Number	Shape and space	Pattern

Summer Term

Block 1	Block 2	Block 3	Block 4	Block 5	Block 6
2 weeks	2 week	2 weeks	3 weeks	1 weeks	1 week
Number	Number	Shape and Space	Number	Pattern	Make connections

Autumn Goals

Number	Numerical Patterns
• I can quickly say how many there are (up to 3) in different arrangements • I can start to show how numbers can be made up • e.g. I and 3 is 4 and know there is more than one way of doing this • I can subitise to 5 • I can compare size (big, small) • I am beginning to match number to quantity (to 5)	• I can count to 10 by rote • I can compare manipulatives (e.g. saying when one tower is bigger/smaller) • I can continue and copy patterns • I can create my own patterns • I can identify shape properties (2D shapes)

Autumn

Block 1 - Comparison (2 weeks)

Step 1: Match objects

Step 1: Children begin by matching physical objects with other physical objects. They are given many opportunities to recognise the attributes of familiar items and identify how they are the same. Encourage children to explain why the objects match, such as recognising that two cars in the small world area are the same because they share the same colour and number of wheels.
It's also important to point out objects that do not match, using the terms "same" and "different" to expand their vocabulary, using Makaton signs to further support their understanding. Matching opportunities will naturally arise in all areas of the classroom. Observe children's play both inside and outside, and highlight when they naturally match objects.

Step 2: Match pictures and objects

Step 2: Children progress from matching physical objects to matching objects with pictures, and then matching pictures to pictures. Labelling resources in the classroom helps children connect the objects they are using to corresponding photos on the shelves. Shadowing equipment, where children match objects to picture outlines or silhouettes, is also useful. Quality adult interactions during tidy-up time provide a valuable opportunity for children to practice this matching skill.

Step 3: Identify a set

Step 3: Children are introduced to identifying sets of different objects. Encourage them to recognise groups of items as sets through images, stories, and classroom activities. Model making sets during daily routines, like snack time, where children can see examples, such as needing a spoon and bowl for cereal or a knife, fork, and plate for lunch.
Initially, model creating sets correctly, then make deliberate mistakes for children to correct (e.g., saying you need a bowl and knife for ice cream). Domestic role-play activities, where children arrange and tidy up resources in sets, are a great way to continue practicing this skill.

Step 4: Sort objects to a type

Step 4: Children build on their knowledge of identifying sets of different objects by learning the concept of 'sorting'. They discover that collections of objects can be sorted based on attributes like colour, size, or shape. Sorting helps children understand what is the same and different about the objects.
Initially, children may focus on sorting by one attribute (e.g., colour), thoroughly exploring that before moving on to others. Open-ended questions can support children in explaining how they sorted the objects. It's important to introduce other sorting criteria, such as shape and size, to broaden their understanding and prevent them from thinking that colour is the only way to sort.

Step 5: Explore sorting techniques

Step 5: Children build on their basic sorting skills by exploring different sorting techniques. Encourage them to sort objects and explain how they've sorted them. Ask if they can sort the same set of objects in different ways.

Support children in sorting using more than one attribute, such as size and shape (e.g., big and round). Model how the same set of objects can be sorted in multiple ways using various attributes. Spend time with children discussing and experimenting with different sorting techniques.

Step 6: create sorting rules

Step 6: Children use their knowledge of sorting techniques to create their own sorting rules. Model games like 'Guess my rule', where children figure out why certain objects have been sorted into a group. Encourage them to focus on the common attribute, ignoring the differences between items.

Demonstrate various sorting rules in the classroom and invite children to challenge you by creating their own rules. Show collections with one incorrect item for children to identify and correct. Display photographs of the children's sorted collections and ask others to explain the different sorting rules.

Step 7: Compare amounts

Step 7: Children build on their sorting skills by learning to compare and order sets of objects. They will use the language 'more' and 'fewer' to describe comparisons between sets. Use Makaton signs to support their understanding of more and fewer. Children should understand that one set can have more items, fewer items, or the same amount as another. The focus is on comparing sets of objects, but the language 'more' and 'less' should be used when comparing other types of sets, such as amounts of liquid.

To make comparisons easier, start with sets where the difference is greater (e.g., comparing sets of 5 and 2 objects) rather than smaller differences (e.g., 5 and 6 objects). These comparisons can be practised during daily routines, like tidying up or at snack time.

Key Vocabulary: match, sort, set, same, different, objects, colour, size, shape, subitise, notice, more, fewer

Block 2 - Measures (2 weeks)

Step 1: Compare size

Step 1: Children learn to compare and order objects by size. The differences in size should be noticeable enough to make comparisons by eye rather than through measurement. Model language such as 'big', 'little', 'large' and 'small', and encourage children to describe what they notice. Moving objects closer together can help support their understanding.

Once children recognise and describe differences in size, introduce more specific terms, such as 'tall' and 'short' for height, and 'long' and 'short' for length. Provide opportunities for children to compare size in various contexts across all areas of provision.

Step 2: Compare mass

Step 2: Children are introduced to the vocabulary of mass and learn to compare and order objects by their mass. While they may be more familiar with the term 'weight', it's fine to use 'mass' and 'weight' interchangeably at this stage.

Model the use of terms like 'heavy' and 'light', alongside Makaton signs, and give children opportunities to explore different objects to develop their understanding. When using balance scales, help children understand that the heavier object is lower and the lighter object is higher on the scale. Point out that the scale is balanced when objects have the same mass. To avoid misconceptions, allow children to explore large objects that are light and small objects that are heavy.

Step 3: Compare Capacity

Step 3: Children learn to compare and order objects by their capacity. They will have a variety of opportunities to explore different containers and boxes. Start by exploring the concept of capacity, explaining that it refers to the maximum amount something can hold. Children will use language like 'this holds the most' and 'this holds the least' to describe what they notice. Explore containers when full and empty. Provide a range of different-sized and shaped containers, encouraging children to make basic comparisons. Activities like filling containers in the water area and using various sized boxes in junk modelling are great ways to support children in comparing capacity.

Key Vocabulary: more, fewer, same, amount, compare, order, same, different, size, big, little, bigger, smaller, larger, long, longer, large, small. tall, short, taller, shorter, notice, mass, weight, heavy, light, heavier, lighter, balance, capacity, most, least, full, empty

Block 3 – Pattern (1 week)

Step 1: Explore simple patterns

Step 1: Children are introduced to the concept of patterns and explore simple examples to develop their understanding. They will learn that a pattern is a repeated unit, and patterns can be both visual (e.g., shapes or colours) and auditory (e.g., sounds or rhythms).
Provide children with many opportunities to explore a variety of simple patterns and point out patterns they can see in their environment; such as stripes on clothes or patterns around the school or at home. Encourage participation in sound patterns, rhymes, and stories with repeated words to help deepen their understanding of patterns.

Step 2: Copy and continue simple patterns

Step 2: Children move from exploring the features of simple patterns to copying and continuing basic patterns. They are introduced to AB patterns, which consist of two repeating parts, such as red/green or dog/cat.
Support children in copying AB patterns with both sounds and objects. Activities like 'my turn, your turn' drumming help reinforce sound patterns and rhythm. For additional support, encourage children to copy small sections of a pattern before attempting to complete the whole pattern. Children should also try to identify and continue the pattern, verbalising it to reinforce the AB structure. When modelling patterns, ensure there are three full units of repetition for children to copy, and expose them to patterns that build both vertically and horizontally.

Step 3: Create simple patterns

Step 3: Children progress to creating their own simple AB patterns, initially with guidance and then independently. Encourage them to create patterns with objects, especially those related to their interests to make the activity more engaging.
Children should have opportunities to create AB patterns in various contexts, such as shapes, colours, actions and sounds. Once they are confident in making patterns, introduce a challenge by asking them to spot and correct errors in an AB pattern. Start with an extra item added to the pattern, then progress to having an item missing. Prompt children to fix the mistake, reinforcing their understanding of patterns.

Key Vocabulary: pattern, repeat, continue, repeat, finish, make, mistake, wrong

Block 4 – Number (2 weeks)

Step 1: Find 1, 2 and 3 (Cardinality and Counting)

Step 1: Children will explore different representations of the numbers 1, 2, and 3 by focusing on recognising, not creating, these representations. Begin by helping them confidently say the number names aloud. Then, guide them to match the spoken names to numerals and quantities. Encourage counting up to three using objects in various arrangements, emphasising one-to-one correspondence and understanding the final counted number is the quantity in that set. Use stories, pictures and group examples to illustrate these numbers and encourage noticing 1, 2, and 3 in their surroundings.

Use the phrase, *'Don't count, say the amount!'* when encouraging children to subitise.

Step 2: Subitise 1, 2 and 3 (Cardinality and Counting)

Step 2: Children will practice perceptual subitising, which involves instantly recognising the number of items in a group without counting. By subitising groups of 1, 2, and 3 items, they develop an understanding of how these numbers look and what they consist of. Using images, stories, dice and spinners with dots helps reinforce this skill. Presenting objects in various arrangements ensures children do not associate numbers with fixed patterns, fostering flexibility in their number recognition.

Step 3: Represent 1, 2 and 3 (Cardinality and Counting)

Step 3: Children build on previous learning by creating their own representations of the numbers 1, 2, and 3 using various objects. They can match these representations to numeral cards while practicing counting and subitising to verify their work. Emphasis is placed on touching each object as they count and understanding that the final number spoken represents the total quantity. This activity can be extended to include groups of sounds or movements, such as counting drumbeats, claps, or jumps up to 3, adding variety and reinforcing their understanding.

Step 4: 1 more' (Comparison)

Step 4: Children are introduced to the concept of 1 more, still only working with the numbers 1, 2, and 3. They learn that as they count, each number is 1 more than the previous, recognising how numbers and amounts increase by adding 1. They should recognise that the order of the numbers when counting does not change. This is the stable order principle. Stories, songs, and rhymes help illustrate this concept, while manipulatives like cubes allow children to visually and physically represent the 1 more pattern. Through play and exploration, children are encouraged to notice and compare this pattern in various contexts.

Step 5: 1 less (Comparison)

Step 5: Children are introduced to the concept of 1 less using the numbers 1, 2, and 3. They learn that as they count backward, each number is 1 less than the previous one, understanding that finding 1 less means reducing the total by taking 1 away. They should recognise that the order of the numbers when
counting does not change. This is the stable order principle. Stories, songs, and rhymes are used to illustrate the concept, while manipulatives like cubes help children visualise and represent the 1 less pattern. Through play, they are encouraged to notice and compare this pattern in different contexts.

Step 6: Composition of 1, 2 and 3 (Composotion)
Step 6: Children are introduced to the concept that numbers are made up of smaller parts, which is crucial for their understanding of number composition. Learning to see a whole number and its parts at the same time is a key development in children's number understanding. They are given practical opportunities to explore different ways to partition a whole number, so they can find different parts which make the same whole. For example, 3 can be split into 1 and 1 and 1. As children explore partitioning numbers, they may also notice and investigate how larger numbers can be composed in various ways during play, although the focus remains on numbers up to 3.

Numbers can be partition into more than two parts.

Key Vocabulary: subitised, 1, 2, 3, count, number, amount, altogether, part, whole, partition

Block 5 – Shape and Space (1 week)

Step 1: Identify and name circles and triangles
Step 1: Children will begin to notice and describe the properties of circles and triangles. They may use informal terms like "pointy" or "sharp" and should be introduced to mathematical language such as "sides," "straight," "corners," and "round." Children will learn that triangles have three straight sides and corners, while circles are perfectly round and flat.

Step 2: Compare circles and triangles
Step 2: Children will use their understanding of circle and triangle properties to compare shapes, incorporating language related to size. They will explore circles and triangles of different sizes and orientations, learning to identify them regardless of size or direction. Introduce "almost" shapes, like a slice of pizza or a biscuit, and help children explain why they aren't true circles or triangles.

Step 3: Shapes in the environment
Step 3: Children will apply their learning by noticing circles and triangles in their environment. They will look for shapes in the classroom, outside, or during walks and share what they find. Encourage children to compare shapes and talk about their properties, supporting them to identify why certain shapes may not fit the exact definitions of circles or triangles.

Key vocabulary: shapes, circles, triangles, sort, flat faces, 3-D shapes, 2-D shapes, sides, corners, straight, curved

Block 6 – Shape and Space (1 week)

Step 1: Describe position
Step 1: Children will learn and use positional language (e.g., "in," "on," "under," "over," "beside," "between") to describe the position of objects in relation to others. Use stories, gestures and play to model positional language, and provide opportunities for children to practice it in large-scale activities outside, such as building models or taking photographs of each other in different positions. They will represent real places they have visited or in stories with their models and drawings and they will draw maps (link to Understanding the World). Stories will be used to reinforce this (We're going on a Bear Hunt, Little Red Riding Hood, Me on a Map)

Key vocabulary: next to, on top of, behind, above, below, under, over, through, between, beside, map

Block 7 – Number (3 weeks)

Step 1: Find 4 and 5 (Cardinality and Counting)
Step 1: Children will explore different representations of 4 and 5, ensuring they can confidently say the numbers 'one' to 'five' and match these number names to numerals and quantities. Throughout this step, support children with counting principles, such as one-to-one correspondence, and help them recognise that the final number they say represents the total (cardinality).

Step 2: Subitise 4 and 5 (Cardinality and Counting)
Step 2: Children will develop perceptual subitising skills, recognising the number of objects in a group without counting. Encourage them to subitise groups of 4 and 5, helping them understand the structure of each number. Use simple activities with dot patterns and shapes to support this, ensuring children see numbers in different arrangements to avoid fixed patterns.

Step 3: Represent 4 and 5 (Cardinality and Counting)

Step 3: Building on prior learning, children will create their own representations of 4 and 5 using different objects. They will match these representations to numerals and check their work by counting and subitising. Support children with counting principles and encourage them to represent numbers on a five frame, linking the activity to real-life experiences like birthdays.

Step 4: 1 more (Comparison)

Step 4: Children are introduced to the concept of 1 more, working with numbers up to 5. They will understand that each number they say when counting forward is 1 more than the previous one. Use stories, songs, and manipulatives like cubes to model this concept and help children recognise the stable order principle.

Step 5: 1 less (Comparison)

Step 5: Children are introduced to the concept of 1 less, with numbers up to 5. They will understand that as they count back, each number is 1 less than the previous one. Children should notice that the numbers get smaller because they are taking 1 away. They should recognise that the order of the numbers when counting does not change (stable order principle). Use stories, songs, and manipulatives to help children recognise the '1 less' pattern.

Step 6: Composition of 4 and 5 (Composition)

Step 6: Children will explore the idea that all numbers are made up of smaller parts. Learning to see a whole number and its parts at the same time is a key development in children's number sense. Provide practical opportunities for children to partition numbers into two parts, such as 4 being made up of 2 and 2, or 3 and 1.

Step 7: Composition of 1-5 (Composition)

Step 7: Building on previous learning, children will further explore the composition of numbers 1 to 5. They will confidently talk about the parts that make up a whole and represent these parts using concrete manipulatives or mark-making. Provide practical opportunities for children to partition numbers into two parts in a variety of contexts. Encourage children to find different ways to partition the same number.

Key vocabulary: altogether, count, different ways, I can see..., group, subitise, 1 more, 1 less, part, parts, whole, five frame, ten frame, backward, forwards, take away

Block 8 – Shape and Space (1 week)

Step 1: Identify and name

Step 1: Children will notice and describe the properties of squares and rectangles, learning mathematical terms like "sides," "straight," and "corners." They will understand that both shapes have four straight sides and four corners, and that squares are special rectangles where all sides are equal in length. Emphasize that 2-D shapes are flat by using thin representations.

Step 2: Combine shapes with 4 sides

Step 2: Children will explore how squares and rectangles can be combined to form new shapes. For example, two rectangles can create a larger rectangle or a square. Children will fold paper shapes and predict what new shape they will create, developing their understanding that shapes are flat. They will also learn that shapes can be made up of other shapes, much like numbers can be made from smaller numbers.

Step 3: Shapes in the environment

Step 3: Children will apply their learning by identifying squares and rectangles in their environment. They will also discuss "almost" shapes, like why a cream cracker isn't a square. Encourage them to find shapes within shapes in everyday objects, such as windows or signs, reinforcing that 2-D shapes are flat.

Key vocabulary: shapes, square, rectangle, sides, straight sides, corners, 2D shapes

Block 9 – Measures (1 week)

Step 1: My day and night

Step 1: Children will distinguish between events, using language like 'first', 'then', 'after', 'before', 'day', 'night', 'morning', 'afternoon', 'today' and 'tomorrow'. They will also begin to measure time by counting the days or sleeps until an event, using blocks to visually represent time passing, removing one each day to support children's understanding.

Key vocabulary: first, then, before, after, days, sleeps, night, day, morning, afternoon, today, tomorrow, events. time

Spring Goals

Number	Numerical Patterns
• I can count objects, claps, movements up to 10 • I can match numeral and quantity (within 10) • I can quickly say how many there are (up to 5) • I can start to recall some double facts e.g. 1 and 1 is 2 • I can identify different capacity (empty, full, half full, almost empty) • I can identify heavy and light • I am beginning to combine 2 amounts	• I can count to 20, knowing the teen numbers • I can compare two quantities saying when one is bigger/smaller/same • I can say a number that is one more/ less without resources • I am identifying 3D shapes • I can explore and identify some number bonds to 10

Spring

Block 1 – Number (2 weeks)

Step 1: Introduce zero

Step 1: Children are introduced to the concept of zero. They will already have some practical understanding of 'nothing there', 'none' or 'all gone'. Here, they learn that the number name 'zero' and the numeral 0 can be used to represent this idea. Throughout this small step, support children to notice where they see 'zero'. For example, they may notice zero cookies on a plate or see zero leaves on a tree. They can also then be introduced to finding and recognising the numeral in the classroom and outdoor environment. Provide frequent opportunities in planned activities, as well as in provision inside and out, to apply this understanding (for example, noticing that there are zero children playing in the sand).

Step 2: Find 0 to 5

Step 2: Children build on learning from the previous step and use their knowledge of zero to find an amount to five, including zero. When exploring numbers to five through games, support children to recognise when zero occurs. Include resources such as blank number cards or blank faces on a dice. Encourage children to relate these to making the correct number of moves on a track, as well as matching the same amounts. Prompt children to notice when zero occurs in activities in the classroom as well as in daily routines. For example, there are zero people away today or there are zero apples left.

Step 3: Subitise 0 to 5

Step 3: Children continue to develop the skill of perceptual subitising. This form of subitising refers to instantly recognising the number of objects in a group without needing to count them. In this step, the concept of subitising zero objects is introduced, as well as the instant recognition of up to five objects. Encourage children to represent their subitising by showing the numeral '0', showing no fingers or an empty five frame. Use images, stories and rhymes that include representations of 0–5 to embed this skill. Further support children by including blank dot plates and zero representation cards into subitising games.

Step 4: Represent 0 to 5

Step 4: Children build on their understanding of numbers from zero to five. Support children to represent the numbers in many ways and in different practical contexts in order to embed their understanding. Encourage children to use both counting and subitising skills as a way of checking their representations. Use meaningful contexts, such as number rhymes, and prompt children to represent the numbers they see on five frames.
This will consolidate their understanding that when the five frame is full, this represents 5, and when it is empty, this represents zero.

Step 5: 1 more

Step 5: Children build on their knowledge of '1 more' to work with the numbers to 5, including zero. They recognise that zero can be a starting point for counting and the number after 0 is 1 Children should be supported to further embed the stable order principle starting from zero, and to understand that the order of the numbers does not change. Encourage children to represent the '1 more' pattern as they count and use a variety of manipulatives and contexts to model this. Use number rhymes that ascend to encourage children to demonstrate their understanding of the pattern of numbers.

Step 6: 1 less

Step 6: Children build on their knowledge of '1 less' from 1–5 to work with the numbers to five including zero. They recognise that when counting back, we can include zero after 1 In the same way as for '1 more', children should be supported to embed the stable order of the numbers from five to zero and understand that the order of the numbers does not change. Encourage children to represent the '1 less' pattern as they count and use a variety of manipulatives and situations to model this. Use number rhymes that descend to encourage children to demonstrate their understanding of the pattern of numbers.

Step 7: Composition

Step 7: Children are guided to explore the composition of numbers from zero to five. Children will continue to develop the understanding that all numbers are made up of smaller numbers and that this can include zero. Prompt them to notice the different compositions of numbers to five by asking questions such as, "How do you see it?" Encourage children to recognise that numbers can also be made up of more than two parts. Physically drawing around or moving objects will support children with this. Prompt them to describe both the whole and the component parts of the number.

Step 8: Conceptual subitising to 5

Step 8: Children build on their learning of composition to five and perceptual subitising to develop their understanding of conceptual subitising. This is the ability to see sets of numbers within other sets, such as seeing the two and three in the number five, without having to count. Children are taught to recognise a whole quantity by recognising and combining these smaller quantities. Support children to see smaller groups within the whole by using resources that include two colours, such as double-sided counters, sprayed butter beans and two-colour dot plates. Encourage them to notice the groups and subitise them in the same way as they did previously.

Key Vocabulary: nothing there, all gone, number, numeral, zero, less than one, comparing, quantity, more than, less than, fewer than, the same as, equal to (Adult to model this language), subitise, notice, smaller numbers, parts, whole, explore.

Block 2 – Measures (2 week)

Step 1: Compare mass

Step 1: Children build on their learning of simple comparisons from the autumn term to now make more precise comparisons using different units. Children may still be more familiar with the word 'weight' and there is no harm in using this interchangeably with the word 'mass'. Children will become more familiar with using balance scales and distinguish between the different quantities on either side. Use different kinds of scales so children do not think there is only one way to compare mass. It is important to provide a range of resources to explore, including loose parts, so that children can investigate the mass of different objects. Encourage children to make their own water vehicles such as boats and explore floating and sinking activities. Experiment with the concept of mass by putting in and taking out objects or animals, linking to stories.

Step 2: Find a balance

Step 2: Children will further explore mass and progress to discovering how to find a balance. Prompt children to recognise that the scales are balanced when the objects on each side have the same mass. Explore measuring different objects to see which ones balance and encourage children to say why. Explain that the line across the balance scale needs to be straight, using gestures to emphasise the horizontal line. Emphasise to children that when balancing a scale, both sides need to have an equal mass. Task children with exploring how different objects balance and how more than one lighter object will be needed to balance a heavier object. Prompt children to say how many lighter objects balance with one heavier object. Compare to see if there are more or fewer objects on each side of the scale.

Step 3: Explore capacity

Step 3: Children build on their understanding of 'full' and 'empty' to further investigate different capacities and how they relate to each other. They will explore how non-standard units can be used to measure capacity. Ensure a range of resources are available in provision so that children can explore capacity easily and build on more complex comparisons in their language and play. Encourage children to use the language 'tall', 'thin', 'narrow', 'wide' and 'shallow' when describing containers and prompt them to experiment filling these using other sized containers. Allow children to use different materials such as water, rice, sand and beads to explore the containers' capacities.

Step 4: Compare capacity

Step 4: Children will continue to explore capacity in this small step and will move on to making comparisons. Encourage children to make direct comparisons by pouring from one container to another. During activities and in provision, prompt children to use smaller pots or ladles to make indirect comparisons by counting how many of one container it takes to fill another. Children can then order the containers from the smallest capacity to the greatest capacity. Ensure children are provided with opportunities in the outdoor provision to compare the capacity of larger containers. Mud kitchens, sand and water areas all provide opportunities for both direct and indirect

comparisons outdoors. Enacting scenarios such as 'sabotaging snack' in provision can support further discussion and discovery of comparing capacity. For example, all the cups or bowls are different sizes.

Key Vocabulary:
Capacity - full, nearly full, half full, nearly empty, empty, most, least, capacity, containers, thin, tall, narrow, wide, shallow, compare, investigate, The container is full/half full/empty. The _____ holds the most/least water.
Mass - Heavy, heavier than, heaviest, light, lighter than, lightest, balanced, difference, estimate, larger, smaller, the _____ is heavier than/lighter than the _____.

Block 3 – Number (2 weeks)

Step 1: Find 6, 7 and 8 (Cardinality and Counting)

Step 1: children explore finding different representations of the numbers 6, 7 and 8 Support them to first match the verbal number names to quantities and then to numerals. Children should be encouraged to continue to apply the counting principles when they count to 8 and when they represent these numbers in different ways. Provide opportunities for children to use one-to-one correspondence to count 6, 7 and 8 objects from a larger group. To further develop children's understanding of cardinality, support them to know when to stop counting and that the number they say is the total number of objects in the set.

Step 2: Represent 6, 7 and 8 (Cardinality and Counting)

Step 2: Children build on their learning of finding the numerals and quantities of 6, 7 and 8 by making their own representations. Encourage them to name their representations and prompt them to match numerals to these quantities. Ask children to draw their representations when noticing amounts, such as the colours in the rainbow or 8 legs on a spider. Prompt children to represent up to 8 objects by introducing them to using a ten frame. Support them to understand that we have 5 if the top row of the ten frame is full. Remind children to fill the ten frame in the five-wise pattern from left to right, so they can see the '5 and a bit' structure. Encourage children to subitise the 5 and start to recognise the pattern of 6, 7 and 8 on the ten frame.

Step 3: 1 more (Comparison)

Step 3: Children are introduced to the concept of '1 more' when working with numbers up to and including 8 They begin to understand that as they count forwards beyond 5, each number is 1 more and the numbers still increase by 1 Prompt children to recognise the stable order of the numbers and use a range of representations, including '1 more' stories and rhymes, to support this understanding. This can be exemplified on a ten frame as children see the numbers filling more of the spaces and see the pattern of each number. Prompt children to represent the '1 more' pattern as they count and encourage them to act out rhymes and scenarios in places such as the small world area.

Step 4: 1 less (Comparison)

Step 4: children are introduced to the concept of '1 less' with numbers from 0–8 Children begin to understand the relationships between these numbers and notice that, as we count backwards, the numbers get smaller, because we are taking 1 away. To consolidate the stable order principle, prompt children to recognise that the order of the numbers does not change when we count back. Use stories, rhymes and scenarios that include finding and representing 1 less to support this concept from 8 to zero. Encourage children to count back from 8 to zero and then blast off like rockets to add enjoyment to the start of adult-led activities.

Step 5: Composition of 6, 7 and 8 (Composition)

Step 5: Children explore the composition of numbers to 8. They learn how their skills of perceptual subitising and counting can be used to see and represent the composition of larger numbers in different ways. Children should be given the opportunity to explore partitioning in many ways with a wide range of objects. Encourage children to find all the ways that they can partition the same number. Prompt children to represent the parts they see, using concrete manipulatives or through mark-making. Providing birthday cards with images that show the cardinal number allows children to make their own number lines that have relevance to them. Children can then be encouraged to explore composition by making their own cards – for example, drawing out the composition of balloons on an 8 card. Use well-known texts, such as Quack and Count by Keith Baker, to point out amounts and then ask children how they see the parts of that number.

Step 6: Make pairs – odd and even

Step 6: Children build on their earlier work matching numerals to quantities by now finding and making pairs. They begin to understand that a pair is two. Provide collections of items that come in pairs. Encourage children to arrange quantities into pairs and to notice that some quantities will have an odd one left over with no partner. Use everyday routines and practical activities, such as talking partners and P.E. games, to point out where we have odd or even amounts. Encourage children to notice pairs and odd and even numbers through games involving matching pairs, such as snap or memory games. Show children the pair-wise pattern of filling a ten frame and how this can support them to notice odd and even numbers. When objects cannot make a pair, there is an odd number.

Step 7: Double to 8 (find a double) (Composition)

Step 7: Children are introduced to the concept of doubling and they learn that this means 'twice as many'. They should be given opportunities to see a range of visual representations of doubles and to find them in patterns, in pictures and in arrangements of manipulatives. Encourage children to use familiar equipment to find doubles and make double collections. Books involving doubles are a good way to introduce this concept. It is important for children to build on this skill over time using smaller numbers first. Prompt children to notice doubles by playing games such as dominoes, where children can use their previous knowledge to match the same number of dots. Model finding doubles, for example, on a dice: "There are 3 here and 3 here, so double 3 makes 6!"

Step 8: Double 8 (make a double) (Composition)

Step 8: Children build on their knowledge of finding a double by now physically making them using manipulatives and their own mark-making. They should be given opportunities to build doubles in many different contexts. Encourage children to use their fingers and make the same amount on each hand then tap their hands together to show doubles during carpet times. Building numbers using the pair-wise pattern on ten frames will help children to see the doubles. Mirrors and barrier games are a fun way for children to see doubles as they build and explore early symmetry. Encourage children to say the doubles as they build them, for example, "Double 2 is 4." It is important for children to do this practically and say the double as they are making the representation rather than just reciting number facts. Provide examples that represent doubles and not doubles for children to sort and explain how they know.

Step 9: Combine 2 groups (Composition)

Step 9: children begin to combine two groups to find how many there are altogether. They should be given opportunities to do this in many contexts using different manipulatives and real-life objects. Present interesting images for children to look at and point out where they may see the groups. Then encourage children to talk about the groups they see with a partner. Encourage children to subitise where possible, although they may still need to count in ones at this stage to find out how many there are altogether. Use songs and stories to support bringing two groups of items together. In provision, use real-life objects, such as plates of cream crackers during snack time, to show how two groups can be combined. As children become more confident, support them to show you how they can combine their own groups and to explain their thinking.

Step 10: Conceptual subitising (Composition)

Step 10: Children are taught to use their skills of perceptual subitising to recognise the groups within numbers greater than 5, allowing them to conceptually subitise. This is the ability to identify a whole quantity by subitising the smaller quantities that make up the whole number. This skill will support children to develop mental images for addition and subtraction, which helps them to move away from counting on and counting back. Prompt children to recognise a number by grouping it into small sets. Ask them to say the whole number first and then how they knew by naming the two parts or more that they saw. Model conceptual subitising to children by using stem sentences, for example, "I can see 8. There are 4 here and 4 there. There are 8 altogether." Use dot plates with two colours to support children to see the two groups within the whole.

Key Vocabulary: subitise, count, notice, smaller numbers, whole, parts, explore, order, compare, pair, smaller, groups, odd, even, left over,

Block 4 – Measures (2 weeks)

Step 1: Explore length

Step 1: Children are encouraged to explore objects and begin to use the language of length to describe them. Begin this process by exploring and describing two objects so that children can see 'long' and 'not long', and 'short' and 'not short'. Ensure that resources in provision are varied and allow children to start to make simple comparisons to develop a sense of 'long and short'. Encourage children to physically move objects so they can see the difference. By using materials such as dough, children can see that materials can be changed by stretching them to make them longer. Children should be shown how to make the ends of objects line up so that they can see the difference and should be taught that 'length' is the distance between two points. Encourage children to make collections of similar objects, such as sticks outside, to support them in gaining an understanding of length.

Step 2: Compare length

Step 2: Children build on their explorations of length to now make comparisons. Encourage children to use more specific vocabulary to describe an object, such as 'longer than' or 'shorter than' something else. Encourage children to make indirect comparisons using nonstandard objects, such as blocks or cubes, to measure items, for example, "The sand tray is four blocks long." A good way for children to explore the concept of length is by representing their thinking using their own mathematical graphics in mark-making. Encourage them to explain their ideas as they draw these representations. Reading stories that involve using simple measuring equipment and enacting these scenarios, will encourage children to use the language and actions of measure in their play and own investigations.

Step 3: Explore height

Step 3: Children build on the skills they have developed when exploring and comparing length by now exploring height. Support children to understand that height is a type of length. Children should be introduced to the language of both 'short' objects and 'tall' objects through

experiences. Going on walks and seeing buildings and trees that are tall in comparison to themselves and to other objects is a way to support this. Children will have little concept of their own size to begin with, so drawing around each other and then holding the paper up is a good way for children to recognise how tall they are. Join children in their play to make tall towers and short towers in box modelling or construction, modelling the language of height. Reading stories that use this language will support children to become familiar with the concept of height so that they can then demonstrate this in their play.

Step 4: Compare height

Step 4: Children move on to using the language 'tallest', 'shortest', 'taller' and 'shorter' to make comparisons. Demonstrate how objects and children themselves can be ordered according to height. This can begin with two objects and then extend to ordering more, such as a group of children in the class. Support children in their comparisons by building towers as tall as a partner's tower or as tall as different animals. Use non-standard units, such as crates, to take learning outside and explore bigger structures. If supported and encouraged by adults in provision areas, children will compare and discuss length and height, using the language of each interchangeably in their play.

Step 5: Talk about time

Step 5: Children will have already begun to understand simple time differences, such as night and day. In this small step, children are encouraged to talk about time in more detail. Support children by giving them reference points, such as photographs of events on a journey wall or in a book, so that they can recall past experiences and notice seasonal change. Discuss what is happening tomorrow, next week or at the weekend to support children to talk about the more immediate future. To give children a concept of time passing, make regular references to time in daily routines, sing songs such as Days of the Week and recall the days that have passed.

Step 6: Order and sequence time

Step 6: Children are encouraged to use simple strategies to discuss time and then progress to ordering and sequencing simple events. Use calendars to mark off the days leading up to special events to help to show the passing of time. Children will not yet understand standard units of time; however, pointing out when key events are happening, such as the clock showing twelve for lunchtime, can help to develop this. Use real life scenarios to support children to sequence events that require a time, such as baking or preparing snack. Enacting stories that follow a sequence of events or the days of the week will support children to sequence time in simple ways.

Key Vocabulary: height, length, long, short, tall, longer than, shorter than, taller than, wider, narrower, measure. The _____ is longer/shorter/taller than the _____, order, sequence, events, now, before, later, soon, after, then, next, yesterday, today, tomorrow.

Block 5 – Number (2 weeks)

Step 1: Find 9 and 10 (Cardinality and Counting)

Step 1: Children explore different representations of 9 and 10 As in previous blocks, the focus is on finding the representations rather than making them. Start by ensuring children can confidently say the number names 'nine' and 'ten'. Once they can do this, they will match the verbal number names to numerals and quantities. Encourage children to count to 10 using objects in different arrangements by touching each object as they count. They should recognise that the final number they say is the quantity in that set. Share stories and pictures that represent 9 and 10 and have children point out the groups they see. Encourage children to find objects in provision and notice groups of 9 and 10 as well as the numerals. This will prepare children to then be able to make their own representations as they have become so familiar with seeing 9 and 10 in different ways.

Step 2: Compare numbers to 10 (Comparison)

Step 2: Children continue to make comparisons with the numbers and amounts to 10 Encourage children to compare amounts directly by lining the items up with one-to-one correspondence. Through exploring comparison, they will develop an understanding of equivalence and non-equivalence. They understand that when making comparisons, a set can have more items, fewer items, or the same number of items as another set. Model counting each set carefully and make comparisons by comparing the position in the counting order. As children's sense of number develops, so does their knowledge of where each number sits on a mental number line in relation to other numbers. They begin by comparing two quantities and progress to ordering three or more quantities. Children may also naturally begin to subitise and compare 9 and 10 on ten frames.

Step 3: Represent 9 and 10 (Cardinality and Counting)

Step 3: Children further explore representations of 9 and 10 and represent them in different ways. Provide opportunities for children to embed the counting principles when counting to 9 and 10 forwards and backwards. Remind them to touch each object as they count and that the final number they say is the quantity of the set. Encourage children to count and subitise as a way of checking their representations. Extend how children represent 9 and 10 and support the abstraction principle by including movements such as claps or clicks. Cue children to listen to the number of sounds when banging a drum up to 10 times, and prompt children to show the number of beats on their fingers.

Step 4: Conceptual subitising to 10 (Composition)

Step 4: Children develop their conceptual subitising skills and start to recognise the groups in numbers to 10. Children use conceptual subitising to identify a whole quantity within 10 by subitising the smaller groups that make up that number. This skill will support children to develop mental images for addition and subtraction, which helps children to move away from counting on and counting back. Prompt children to recognise a number by grouping it into smaller sets and then saying each amount before confirming the whole number. Use dot plates to support children to see two or more groups within the whole. Encourage children to mark-make and print with bingo dabbers to represent the numbers to 10. They can then subitise where they see smaller groups and draw around them. Ensure children are given opportunities for developing subitising skills outside as well as inside so these activities are practical and fun.

Step 5: 1 more (Comparision)

Step 5: Children build on their skills of finding '1 more' with numbers to 8 by now recognising this pattern with the numbers to 10 Children understand that as they count on, each number is 1 more than the previous number. They become aware of consecutive numbers and see that amounts increase in size when 1 more is added. They should recognise that the order of numbers when counting does not change and have the stable order principle embedded with the numbers up to 10 Read stories that include the '1 more' pattern and support children to notice and make comparisons as they play in provision.

Step 6: 1 less (Comparison)

Step 6: Children extend their skills of finding '1 more' with numbers to 10 to finding '1 less' with numbers to 10. Children understand that as they count back, each number is 1 less than the previous number. They become aware of consecutive numbers and see that amounts decrease in size when 1 is taken away. They should recognise that the order of numbers when counting back does not change and have the stable order principle embedded with the numbers up to 10. Read stories that include the '1 less' pattern and support children to notice and make comparisons as they play in provision.

Step 7: Composition to 10 (Composition)

Step 7: Children are encouraged to build on their conceptual subitising, '1 more' and '1 less' skills by focusing on the composition of numbers to 10. As children's number sense develops, they learn to see greater numbers as a whole number and its parts at the same time. Encourage children to represent their different compositions of numbers to 10 by providing varied representations to show the different compositions. Explore partitioning in different ways with a wide range of objects to develop children's awareness. Play games that explore the composition of numbers to 10 so that children can then emulate these in their own play and self-chosen activities. Sharing stories and images that display different compositions and pointing these out will emphasise this concept to children. Talk to children as they use marks and signs to represent their ideas of composition. Point out composition to ten when playing with children in provision.

Step 8: Bonds to 10 (2 parts) (Composition)

Step 8: Children explore number bonds to 10 using real objects in different contexts and build 10 using two parts. In provision, explore different ways of building the bonds to 10, for example, parking 10 toy cars in two car parks. Ten frames or egg boxes with 10 holes can be partially filled with objects. Ask children how many more we need to make 10 Providing sets of 10 objects in provision supports children to make their own self-chosen explorations of the bonds to 10. Seasonal songs also support children making bonds, using actions with fingers to represent making 10

Step 9: Make arrangements of 10 (Composition)

Step 9: Children explore the number 10 and the different ways 10 can be arranged. Show children different arrangements and ask what they notice. Support children to make patterns with concrete resources to 10 to allow them to become familiar with manipulating numbers. They may also then wish to explore making arrangements of different numbers. Support children to notice that the overall number is still the same, no matter where they count from or what arrangements they make. This is the 'order irrelevance counting principle'. These activities will help deepen children's understanding that numbers can be made of many different arrangements and each arrangement tells a story about that number. Using objects of interest, encourage children to make pattern-like arrangements and discuss what the pattern might tell us about the number 10 To deepen children's understanding, prompt them by asking questions such as, "Do 5 and 5 always make 10?"

Step 10: Bonds to 10 (3 parts) (Composition)

Step 10: Children explore bonds to 10 further and learn that there can be three or more parts, not just two. Children will need to see this in a variety of different ways, exploring this concept practically to embed it. In provision, explore different ways of building the bonds to 10, for example, with small world animals: 3 ducks in the water, 4 in the grass and 3 on the bridge. Ten frames or egg boxes with 10 holes can be partially filled with objects, but now with three colours available. Fill the holes with a combination of two colours and ask how many more of a third colour we need to make 10. Providing sets of 10 objects in provision will support children to make their own self-chosen explorations of the different bonds to 10

Step 11: Doubles to 10 (find a double)

Step 11: Children build on their explorations and findings about doubles to 8, by progressing to doubles to 10. Children will be used to the concept of doubling and the fact that this means 'twice as many'. Further support children to see a range of visual representations of doubles and identify them in patterns, in pictures and in arrangements. By repeating these activities, children will naturally be able to find doubles and recognise them in their play. Encourage children to find the doubles to 10 by sorting doubles and 'not doubles', so that they can begin to categorise the numbers and amounts/ representations. A good way to embed this concept and encourage children to see doubles is to make up rhymes that use the language of doubling. Prompt children to see the doubles to ten in all areas of provision.

Step 12: Doubles to 10 (make a double)

Step 12: Children embed their learning of finding doubles to 10 and then make their own sets and arrangements of doubles. If encouraged and supported to do this, children will be naturally curious to explore their own findings. Encourage children to represent their understanding by making doubles with manipulatives such as counters on ten frames or in activities such as printing. Barrier games are a good way of supporting children to make and describe the doubles they have made. Allow children to explore and demonstrate this both inside and out using large ten frames and encourage them to show their thinking using the pair-wise pattern. Use and enact doubling stories to embed children's understanding and help them make doubles. Children may also recall that all doubles are even numbers, in relation to their exploration of even and odd numbers.

Step 13: Explore even and odd

Step 13: Children expand on their first introductions to the concept of even and odd numbers. As mentioned in the last step, children may have recognised the concept of 'even' from their explorations of doubling. This small step allows children to develop this skill by recalling past knowledge as well as recognising new patterns with numbers up to 10 in different contexts. Encourage children to solve problems by using mathematical graphics to draw out their thinking. By doing this, children can be supported to explain their reasoning of why a number of objects may be odd or even. Adults can then prompt children to explain how they know by using key questions and supporting them to use stem sentences. By building up this skill over time, children will be more confident explaining their thinking towards the end of the Reception year.

Key Vocabulary: count, subitise, notice, smaller numbers, whole, parts, explore, order, arrange, compare, count, subitise, notice, explore, order, arrange, compare, position, before, after, more, less/fewer, the same as, equal to (Adult to model this), count, subitise, notice, whole, parts, explore, How many more do we need to make a full ten?

Block 6 – Shape and Space (1 weeks)

Step 1: Recognise and name 3-D shapes

Step 1: Children will focus on the concept of 3-D shapes and their properties. Children will have already explored some of the properties of these shapes in earlier blocks when sorting objects that are 3-D, looking at 2-D shapes, fitting shapes together and moving them apart. They will have also explored printing with 3-D shapes and recognising the flat face the shape makes. In this small step, children will learn to recognise and name cubes, cuboids, cylinders, pyramids, cones and spheres. They will recognise that whereas a 2-D shape is completely flat, 3-D shapes are solid objects. When building and constructing, use the correct shape names to categorise the blocks. To further support children, photograph and label these shapes in provision. Use tidy-up time in the brick area as an opportunity to encourage different groups of children to be responsible for collecting all the cylinders or all the cubes. Share texts that include 3-D shapes and encourage children to identify and name shapes. Prompt them to go and find those shapes in provision.

Step 2: Find 2-D shapes within 3-D shapes

Step 2: Children extend their knowledge of recognising and naming 3-D shapes to finding and identifying the 2-D shapes on the flat faces of 3-D shapes. It is important to teach this knowledge through practical exploration, such as making models, and ask children to point out what they notice. Exploring the idea of flat faces and curved surfaces in activities such as printing will support children to see the 2-D shapes within the 3-D shapes. This can be reversed so that children use reasoning skills to find which shape could have made a pre-printed footprint. Whilst building with children, give reference to what shapes are being used. To emphasise flat faces and curved surfaces, discuss which shapes are better for stacking. Look at pictures and stories that use 3-D shapes and point out where we can see 2-D shapes on the faces of 3-D ones. Replicating structures in books can help to support this thinking.

Step 3: Use 3-D shapes for tasks

Step 3: Children are guided to further expand their knowledge of the properties of 3-D shapes. The suggested tasks and the modelling of shape vocabulary will deepen their understanding of the properties of 3-D shapes. Support children to determine what are the best 3-D shapes for tasks such as rolling or stacking, to develop children's understanding. They consider why this is the best shape as well as what different 3-D shapes do or do not have in common. This will help to develop spatial reasoning skills but also extend where children are on their building learning journey. Support children by prompting them to make more complex structures. Block play can be enhanced by children bringing in further props to allow them to build for a purpose, for example, creating a rocket for an astronaut. Children may then design and make their own structures to support roleplay and storytelling.

Step 4: 3-D shapes in the environment

Step 4: Children build on their experiences of 2-D shapes in the environment by now looking for representations of 3-D shapes. Children will already have some understanding of the properties of 3-D shapes and that these are solid objects. Start by referring to everyday objects in the environment using names of 3-D shapes, such as a tin of beans being a cylinder. As with 2-D shapes, discuss with children when shapes in the environment are 3-D shapes and when they are 'almost' 3-D shapes. In this way, they will recognise that, for example, a tower on a castle is an 'almost cylinder'; however, the turret stops it being a perfect cylinder. Provide opportunities for children to notice shapes in the environment and use the language of 2-D and 3-D shapes interchangeably to support children's fascinations. Encourage them to take photos when outside or on walks to spark discussion when sharing these in groups or as a class.

Key Vocabulary: stack, roll, similarities, differences, notice, 2-D shapes (their names), 3-D shapes, cylinder, cube, cuboid, sphere, cone, pyramid, edge, curve, straight, round, flat, sides, face, corner, smooth. Note: This is for staff to model.

Block 7 – Shape and Space (1 weeks)

Step 1: Identify more complex patterns

Step 1: Children build on their knowledge of simple AB patterns from the autumn term. They are introduced to more complex patterns such as ABC and ABCD, where all the elements are different. This can then progress to AABB, AAB and ABB patterns. Pattern structures are seen to be easier when all the elements repeat, so children may find AABB easier than AAB. They will then explore patterns with the same start and end point, such as ABBA, which are more complex. Children may naturally join in with sound patterns that fit different structures, and this is all part of learning. It is important to encourage them to listen carefully to adults or music-making sound patterns and identify which structure is being used. Sing and make up silly songs that follow different structures, such as, 'stomp, dinosaur, dinosaur, stomp' for ABBA, so that children recognise that this can be audible as well as visual. Allow children to mark-make their own notations to identify patterns and support their thinking.

Step 2: Copy and continue patterns

Step 2: Children move on from exploring the features of more complex patterns to being able to competently copy and continue them. Support children to copy ABC, ABCD, AABB, AAB and ABB patterns. Patterns may be easier when all the elements repeat, so children may find AABB easier than AAB. Children may then move on to ABBA patterns. When showing and modelling patterns, remember to show three full units of repeat for them to be able to copy and continue it. If children need additional support, first encourage them to copy small sections of patterns before combining them to make the full pattern, then they can attempt to continue it. Your may notice that some children find different types of patterns harder than others. To support this, ensure that there are different resources that link to children's interests and fascinations so they can be encouraged to copy and continue more complex patterns. Children to be encouraged to make a pattern around a border with a fixed number of spaces, investigating whether AB, ABC, ABB, AAB, AABB and ABBA patterns will fit. Children will arrange patterns around a circle, such as a hoop or a paper plate.

Step 3: Patterns in the environment

Step 3: Children build on what they have learned about more complex patterns by applying their skills to patterns in the environment. This might start with spotting patterns in the classroom then extend to looking at patterns when out on walks and when visiting places that are full of pattern experiences. Immerse children in different types of patterns by pointing out patterns and bringing in a selection of wallpapers and fabrics. Allow them to notice pattern styles by reading stories that show different cultural styles of pattern, for example, where certain forms of shape are used or how fabric is weaved. Model noticing patterns all around us, so that it becomes a key talking point. Praise children for making links between the different elements of pattern and shape.

Key Vocabulary: notice, same, pattern, copy, continue, create, repeat, unit.

Summer Goals

Number	Numerical Patterns
• I can show how numbers to 10 are made up using different models e.g. part whole, tens frame • I can recognise the numerals to 10 and match to quantity consistently • I can recognise quantities up to 5 without counting • I can recall number bonds up to 5 and some to 10 • I can match subtraction facts with number bonds • I can recall some double facts within 10 • I can recall number bonds to 5 • I can start to give some linked subtraction facts • I can start to recall some double facts e.g. 1 and 1 is 2	• I can count beyond 20 • I can compare quantities using greater/ more than, fewer/ less than, the same/ equal • I can show patterns in numbers to 10 • I can talk about odd and even numbers • I can say double facts • I can share equally

Summer

Block 1 – Number (2 weeks)

Step 1: Build numbers beyond 10 (10-13) (Cardinality and Counting)

Step 1: Children become more familiar with numbers beyond 10 and the pattern (stable order) of numbers to 20 and beyond. Children will be familiar with larger numbers from daily routines such as counting children or the days in the month. This small step focuses on numbers beyond 10. First, ensure that children can say the numbers 11, 12 and 13 and support them to use one-to-one correspondence to count items beyond 10. Provide varied opportunities for building the numbers 10, 11, 12 and 13 to support children's understanding. Encourage children to play games that involve these numbers, and count on and back to improve children's knowledge of the stable order counting principle.

Step 2: Continue patterns beyond 10 (10-13) (Cardinality and Counting, Composition)

Step 2: Children continue to build and notice patterns with numbers beyond 10 (up to 13). Provide opportunities for children to recognise that the numbers 1 to 3 repeat after every full ten. So, they have 1 ten and 1, 1 ten and 2, 1 ten and 3. It is important to embed this skill with numbers to 13 first, before going up to 20. Encourage children to count on and back from different starting points, to say what comes before or after a given number and to place numbers in order. Challenge children to notice 11, 12 and 13 in displays and stories. Use stories linked to interests to embed the stable order. Children enjoy correcting puppets who make counting errors or say the numbers incorrectly. Daily counting routines and games provide many opportunities to regularly count beyond 10

Step 3: Build numbers beyond 10 (14-20) (Cardinality and Counting, Comparison)

Step 3: Children build on their skills using the numbers to 13 to become more familiar with the numbers to 20. This small step focuses on building numbers to 20. Provide many opportunities for children to build these numbers, again focusing on the ten and 4, 5, 6, 7, 8,9. Continue to encourage them to build the numbers using the sequence identified in number stories. Use manipulatives to explore the structure of numbers beyond 10. Simple matching games can support children to link the number to the quantity, using resources such as number and representation cards. Encourage children to use loose parts and objects of interest to make these larger numbers. Use ten frames to support and emphasise the structure they are building. Allow children to explore larger staircase models and patterns that show that the next number is one more than the previous number.

Step 4: Continue patterns beyond 10 (14-20) (Cardinality and Counting, Composition)

Step 4: Children develop their experiences of building the numbers from 14 to 20. They will now focus on seeing the pattern of ten and 4 more, ten and 5 more, ten and 6 more, and so on, which will then be built on further in later year groups. Support children to recreate this pattern in provision using different resources and contexts, such as putting a given number of vehicles on a road or a given number of blocks in a tower. Having an empty washing line and number cards available for children to sort will support children to

recognise numerical patterns. A good way to support children to see what comes next in a sequence is by having a puppet remove or reorder familiar resources, such as number shapes in an interactive display.

Step 5: Verbal counting beyond 20 (Cardinality and Counting)

Step 5: Children will focus on counting verbally beyond 20. Children should already have heard the numbers beyond 20. This step provides time to focus on this skill in adult-led learning. However, this will also need to be embedded in daily routines to support children to become confident. In this small step, children focus on the process of counting and the numerical patterns. Provide many opportunities for verbal counting beyond 20, pausing at each multiple to draw out the structure. Playing games and taking part in activities involving numbers beyond 20 can help to develop this skill, focusing on saying the numbers out loud.

Step 6: Verbal counting patterns (Cardinality and Counting)

Step 6: Children build on verbal counting beyond 20 by noticing the counting patterns involved. Provide calendars, hundred squares or number tracks, both inside and out, either painted or marked out on the ground. This will support children to become familiar with 2-digit numbers beyond 20 and to start to spot the patterns within them. Children may naturally be curious about bigger numbers. Read stories such as 1 is One by Tasha Tudor with children, paying particular attention to how each number is represented in the pictures to support counting larger numbers. It is important that this skill should still remain fun and active, so that children are eager to count. A good way to encourage this is for one child to pick the starting number, such as the date of the month, and another to say if we will be counting on or back. Children can also pick what actions they count, such as taps, clicks or stamps, to embed this skill and make it memorable.

Key Vocabulary: count, subitise, notice, whole, parts, explore, count on, count back, forwards, backwards, numerals, notice, patterns, repeating, before, after, sequence, order, ten, 1 ten, 1 ten and __more

Block 2 –Number (1 weeks)

Step 1: Add more

Step 1: Children build on their understanding as they explore the change structure of addition (augmentation) by adding more. The focus for this step is on increasing a quantity by a given amount, while continuing to work within 10. Children will use real objects to see that the quantity of a group can be changed by adding more. The 'first, then, now' structure is a very effective way to help build their understanding by creating mathematical stories in meaningful contexts. At first, children may need to re-count all the items (for example, 1, 2, 3, 4, 5, 6, 7) to see how many they have altogether. When they are ready, support them to count on instead (for example, 4, 5, 6, 7). Encourage children to enact and represent number stories using ten frames, number tracks and their fingers.

Step 2: How many did I add?

Step 2: Children continue to develop their understanding of the addition change structure by adding more. Children have already explored finding the answer to "How many are there now?" To deepen learning, provide children with 'first, then, now' number stories where the 'then' part is missing. For example, "There were 5 children on the bus, then we don't know how many more got on, but now there are 8 children on the bus." Support children to use real objects, such as a ten frame and counters, to find the missing number that was added. For example, they represent the starting number with red counters and then they add yellow counters until they reach the total amount. The number of yellow counters represents the number that has been added.

Step 3: Take away

Step 3: Children build on their understanding as they explore the change structure of subtraction (reduction) by taking away. Children will have experience of taking away objects in everyday life and this is built on by focusing on taking away more than 1 object. The focus is on decreasing a quantity by a given amount, while continuing to work within 10. Encourage children to use real objects to see that the quantity of a group can be changed by taking some away. Prompt them to remove the items and then count or subitise to see how many are left. The 'first, then, now' structure is an effective way to help build their understanding by creating mathematical stories in meaningful contexts, using ten frames, number tracks and their fingers.

Step 4: How many did I take away?

Step 4: Children continue to develop their understanding of the subtraction change structure by taking away. Children have already explored finding the answer to "How many are there now?" To add challenge, provide children with 'first, then, now' number stories where the 'then' part is missing. For example, "There were 5 children on the bus, then we don't know how many got off, but now there are 2 children." Support children to use real objects to find the missing number that was taken away. They can represent the starting number with counters on a ten frame, then remove counters until they represent the number of items there are now. Prompting children to talk about how many counters were taken away will help them understand the missing part.

Key Vocabulary: quantity, group, more, add, first, then, now, count, altogether, subitise, quantity, group, less, take away, first, then, now, count, altogether, subitise.

Block 3 – Shape and Space (2 weeks)

Step 1: Select shapes for a purpose

Step 1: Children have already had experience of selecting shapes for a purpose when using 3-D shapes for tasks. In this small step, this learning is extended to further exploring the properties of shapes and spatial relations. Provide opportunities for children to explore the attributes of shapes and to select shapes for a particular purpose. Encourage them to explain why they chose a particular shape and why other shapes would not be suitable. Prompt children to explore using pattern block shapes and encourage them to fill templates or make their own pictures. Children could also explore selecting shapes for a purpose outside by using large-scale construction to build large models such as vehicles or dens.

Step 2: Rotate shapes

Step 2: Children will explore how shapes will appear when rotated. A key thing to look out for is that children may not recognise a shape when its orientation changes. For example, children often do not recognise triangles and squares when they have been rotated. Rotating shapes is an important step, as it will help to support children to visualise how shapes and objects will fit together in later steps. Provide opportunities for children to select and rotate shapes to fill a given space. Using jigsaws, number shape baseboards and pattern block templates can help to support this. Prompt children to notice that some jigsaw pieces are corner pieces and that some have straight edges. They may also notice that the pieces have 'sticky-out bits' or holes. Encourage children to notice how the pieces fit together or why certain pieces will not fit together.

Step 3: Manipulate shapes

Step 3: Children build on the learning from previous steps by now manipulating shapes. Children will explore moving, turning, rotating and flipping shapes to fit into the spaces provided. Continuing to enhance provision with pattern block templates and number shape baseboards will support children to manipulate shapes. As with rotating shapes, provide opportunities for children to see shapes in a variety of orientations and positions, so they learn that the same shape can look different. Shape sorters can support with this, as they encourage children to turn, rotate and flip shapes. In this small step, tangram pieces are introduced for the first time. Allow some time for children to explore the tangram shapes in open-ended activities before moving on to using these in adult-led tasks.

Step 4: Explain shape arrangements

Step 4: Children use their previous knowledge of positional language and now progress to explaining more complex shape arrangements. Provide opportunities for children to match arrangements of shapes, prompting them to use positional language to describe where the shapes are in relation to one another. In play, prompt children to describe the position of shapes, building blocks or small-world characters. This could also be done on a large scale outside when building and following obstacle courses. Encourage children to play barrier games where two children sit opposite each other with a barrier in between them. A piece of cardboard or a book make good barriers. When playing the game, one child gives instructions to their partner for them to make the same arrangement as them. First, begin without a barrier, then progress to using a barrier but give quick peeks. Finally, extend to leaving the barrier in place so that children must rely on verbal instructions to copy the shape arrangements.

Step 5: Compose shapes

Step 5: Children understand that shapes can be combined to make new shapes. Provide opportunities for children to fit shapes together using resources such as pre-cut gummed shapes, pattern blocks and number rods. Encourage children to investigate how many different ways a given shape can be made using smaller shapes. At first, support children by providing them with certain shapes to use, for example, only the correct shapes that they will need. Then progress to providing them with a larger selection of shapes so that children must decide which to use. Also, they can explore combining a given set of shapes in a variety of ways to make different shapes. Exploring illustrations of how shapes have been combined to make new shapes in books can support children's understanding in this step and provide meaningful contexts for composing shapes.

Step 6: Decompose shapes

Step 6: Children explore identifying shapes within shapes. Children understand that shapes can be separated to make new shapes. Provide children with paper or gummed shapes and encourage them to fold or cut them; for example, by folding a rectangle to make two squares or cutting a square to make two triangles. Exploring how shapes are decomposed in books can provide meaningful contexts for identifying shapes within shapes. After reading these books together, encourage children to decompose shapes in similar ways in provision. Once children have explored decomposing shapes in open-ended activities, ask them to predict what new shapes they can make by folding or cutting. Prompt children to talk about which shapes they will see or predict what will happen if they fold the shape in half

Step 7: Copy 2-D shape picture

Step 7: Children will already have had some experience of making shape pictures in previous blocks. In this small step, children will build on this prior learning and will progress to copying more complex 2-D shape pictures. They will use learning from earlier steps in this block, such as rotating, manipulating and composing shapes to help them when copying shape pictures. Prompt children to talk about the properties of the 2-D shapes they use as they make their pictures and encourage them to use shape vocabulary to explain why they have used the shapes in that way. Encourage children to explore shape pictures in books and prompt them to copy the pictures using pre-cut

gummed shapes. Focus on more complex shape pictures that include more shapes and also include shapes in different orientations.

Step 8: Find 2-D shapes within 3-D shapes

Step 8: Children will have experience of finding 2-D shapes within 3-D shapes from earlier blocks. In this small step, this learning is built on and children are encouraged to notice 2-D shapes within 3-D shapes in a range of contexts. Encourage children to make a range of constructions, using skills from the previous steps in this block to rotate, manipulate and explain shape arrangements. When building, prompt children to talk about why they have chosen each shape or object, particularly focusing on the 2-D shapes within the 3-D shapes and why this makes it suitable for their construction. As a class, explore books that use 3-D shapes and encourage children to notice where they can see 2-D shapes on the faces of the 3-D objects. Children can then build structures in a similar way to the books. Encourage them to talk about the shape properties as they build.

Key Vocabulary: space, shape, combined, separated, fit together, break apart, investigate, rotate, next to, on top of, behind, above, below, under, over, through, between, beside.

Block 4 – Number (3 weeks)

Step 1: Exploring grouping

Step 1: Children will begin to develop an understanding of sharing. They will investigate what sharing is and describe equal sharing as fair and unequal sharing as unfair. Within this block, we explore sharing and grouping, which are both different methods of division. Sharing (see small steps 1 and 2) involves dividing a set equally between a certain number of groups. Grouping (see small steps 3 and 4) involves dividing as et by placing a certain number of items in each group. Activities such as sharing snacks or playing group games are great opportunities for children to notice when it is fair. These practical activities help children see whether items have been shared equally and whether everyone has the same. Children may remember from previous steps the concepts of even and odd numbers relating to this, which will be focused on in later steps. Exposing children to this concept of sharing into groups and beginning to identify when these groups are equal will ensure that children are ready to move on to the next step.

Step 2: Sharing

Step 2: Children will build upon their knowledge of sharing from the previous small step and refine these skills further. Children will share practically for a purpose by having a number of objects to share between various people or groups. Children will learn that to share we need to take one object at a time and give it to one child before taking the next object and giving it to the next child, repeating this process until all the objects are gone or each child has an equal amount. This small step will also address what happens if an amount cannot be shared equally by the number of children that we have; they will identify that, at times, there will be leftover objects that cannot be shared fairly. Children may have ideas on what should be done with leftover objects. Story books that relate to sharing can expose children to a range of scenarios and provide meaningful contexts. Encourage children to discuss their experience of sharing and how they know whether it is fair.

Step 3: Explore grouping

Step 3: Children have explored the method of sharing and will now move on to the method of grouping. When exploring grouping in this small step, children will use their knowledge of equal and unequal groups to support them. Remember that grouping involves dividing a set by placing a certain number of items in each group, whereas sharing (see small steps 1 and 2) involves dividing a set equally between a certain number of groups. When grouping, children divide a set by placing a given number of objects in each group and investigate how many groups they will require. Provide varied opportunities for children to recognise and make equal groups. The use of stories can provide meaningful contexts for grouping. To maximise children's opportunities to independently develop their grouping skills, ensure that classroom provision is enhanced with some labelled groups, for example, by labelling how many pencils belong in each pot. Tidy up time will then provide a relevant purpose for grouping.

Step 4: Grouping

Step 4: Children build upon their knowledge of grouping from the previous step and refine these skills further. Children will group for a purpose and divide a set of objects by placing a certain number of them in each group. They will investigate how many groups they need in order to give out all their objects. When making groups, encourage children to place their objects into pots, bowls or other containers to support them to make distinct groups and to see whether the groups are equal. Children could also explore grouping on a larger scale outside by placing objects into hoops or buckets. Further to this, they could be encouraged to play team games that require them to get into teams of certain numbers. Provide a range of opportunities for children to explore grouping, initially prompting them to divide a number of objects that can be grouped equally. To further develop children's understanding, progress to exposing them to numbers of objects that cannot be grouped equally and so items are left over. Encourage them to come up with their own suggestions for how to resolve this.

Step 5: Even and odd sharing

Step 5: Children have explored sharing and experienced fair and unfair sharing by identifying whether objects are left over. Children will now use these skills in this small step to identify whether a number is odd or even by sharing into two groups. Using language such as

'odd', 'even', 'equal' and 'unequal' will prompt children to make the links to the number of objects they are sharing. Children are encouraged to talk through the sharing process, explaining what they notice and how they know whether an amount is odd or even. To do this, ensure that children are provided with a range of hands-on experiences that use varied resources and different numbers of objects. Encourage children to model their thinking by asking questions such as, "Can you show me what you did?" and "How do you know?"

Step 6: Play with and build doubles

Step 6: Children consolidate their learning of finding and making doubles. Continue to prompt them to explore, investigate and build doubles in a range of different contexts. Encourage children to double numbers but also progress this to showing children a double and asking them to say what number has been doubled, by finding the inverse. Prompt children to use sentence stems to support their mathematical talk. In games and activities, promote and model the automatic recall of double facts, rather than always relying on building the doubles each time. Resources such as towers of cubes, counters on ten frames and dominoes will continue to support children who are not yet secure with recalling all double facts. Drawing on knowledge of even and odd sharing from the previous small step, children may recall that all doubles are even numbers, as they are made up of two equal groups.

Key Vocabulary: twice as many, double, doubling, doubles, pair-wise patterns, build, explore, symmetry, sort, explain, share, sharing, fairly, equally, the same amount, equal, groups, notice, left over, pairs, odd, even, share, sharing, fairly, equally, pairs, the same amount, equal, groups, notice, left over, odd, even, pair-wise patterns.

Block 5 – Pattern (1 weeks)

Step 1: Identify units of repeating patterns

Step 1: Children will deepen their understanding of different patterns, and will begin to develop a secure knowledge of pattern rules and the ability to verbalise their thinking and explain it to others. In this small step, the focus is supporting children to draw out the unit of repeat. First, this can be done physically, by supporting children to pull out the unit from a pattern, for example, from a line of cubes. Encourage children to move the cubes down from the pattern and see each section of the pattern as a unit. This will build on skills from earlier blocks where children identified sets. Encourage children to identify units of repeat in images and books and prompt them to replicate them with manipulatives or drawings. Encourage children to hear the units of repeat in songs, such as beating in time to a rhythm. This is also linked to musical notation and how the beats in a bar are grouped.

Step 2: Create own pattern rules

Step 2: Children expand on drawing out the rule in a given pattern and progress to creating their own repeating pattern rules. Children will need to have had lots of experience in identifying a rule in the previous small step. Support children by modelling your own rules and verbalising them as they are made. For example, when sorting buttons into patterns in a tray, explain why you have picked each button. Using a puppet to model sorting rules is a good way to take the onus off the child to create their own pattern rules. Puppets can also get things wrong and can be corrected! To help children gain confidence and think more deeply, model patterns that start mid-unit of repeat. Encourage children to show their patterns and verbalise their own rules. Children to be challenged to create own pattern rules around a border with a fixed number of shapes. Invite children to create patterns that repeat around a circle. For instance, use a paper plate and have them design a sequence that aligns seamlessly around the circumference. Once the circular pattern is complete, guide them to repeat the same pattern along the outer rim of the plate, introducing concepts of scaling and space utilisation (As the distance around the outside of the plate is greater, the children will need to extend the pattern to fill the space. Ensure that they add in the extra unit of repeat.).

Step 3: Explore own pattern rules

Step 3: Children being able to verbalise and describe their own patterns as well as other children's patterns. Prompt children to comment on each other's patterns as a group and to describe how they have used different resources. Encourage them to ask questions about each other's patterns, such as, "Why did you put that there?" or make comments such as, "I like the way your ABBA pattern works!" Providing tablets or cameras for children to take pictures of patterns is a good way of referencing each other's work. They could also be used during group times or number talk sessions, where patterns can be discussed and described. Deepen children's observational skills on pattern by providing resources that have patterns on them, such as shells or sea creatures. Having a place to perform in the classroom will facilitate and encourage children to act out their patterns (for example, touch head, shoulders, shoulders, head), and to comment on each other's work.

Key Vocabulary: explore, investigate, number, shape, relationship, repeating patterns

Block 6 – Make connections (1 week)

Step 1: Deepen understanding

Step 1: Children will make connections between all the aspects of maths that have been covered through the year. In this small step, we look at deepening this understanding through developing children's reasoning and problem-solving strategies. Give children plenty of opportunities to engage in extended problem solving and develop their critical thinking skills. These problems can be linked to familiar

stories, children's interests or real problems that arise as they play. Children may need support to carry out their plans and make adaptations. Ask children open-ended questions to explore their thinking. Afterwards, encourage children to review and discuss their strategies.

Step 2: Patterns and relationships

Step 2: Children should be given opportunities to explore and investigate relationships between numbers, shapes and patterns to further deepen their understanding and explore possibilities. Classroom resources such as number rods, pattern blocks and unit construction blocks are particularly good for exploring these patterns and relationships. In addition to this, ensure that children are given the opportunity to extend these connections beyond mathematical apparatus and apply them to large-scale activities outside. Support children to enact scenarios where they have to think of more than just one answer, for example, if we all make slime, what do we need to do in order to take it home safely? Allowing children to make decisions about what they would like to do and planning it out loud with supported scribing helps their planning and independence skills. Allow children time to discuss their plans and decisions and to think of all the possibilities.

Key Vocabulary: discuss, explain, changes, think, problem solve.