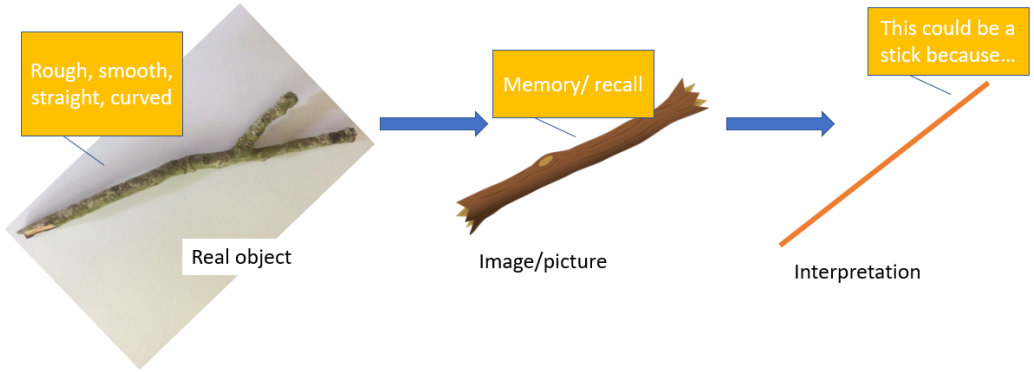
Early Years Maths

Statutory Educational Programme: Mathematics In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space, and measures.
It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Range 5 & 6 ELGs

Developing a schemata

- To understand something you need to be able to connect the concept with a previous experience.



	Weeks 1 - 3	Week 3 - 6	Week 7 -9	Week 10 - 12
Aut	How much, how many?	All about me, 1,2,3!	4 & 5, Jump and Jive	Pick and Mix, Number 6!
Spr	7 & 8, On a Plate	Team 9 & 10	1 to 10, All Again	Twenty Plenty!
Sum	Write & Remember Arithmetic		Maths Explorers & Pattern Finders	

How much?

Cannot be counted by saying number names.

Can be compared by size including length, mass and capacity.

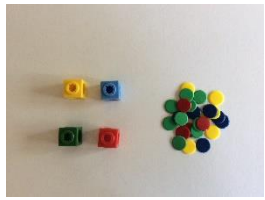
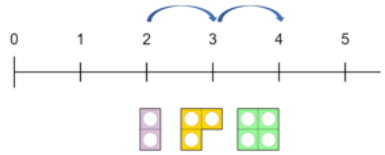
How many?

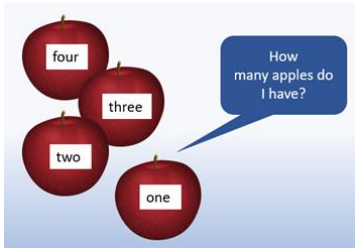
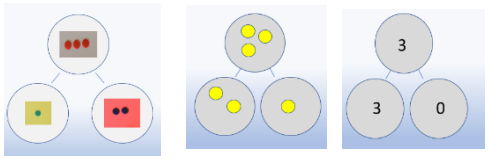
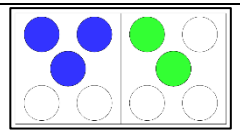
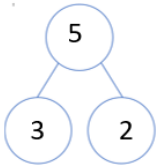
Can be counted, saying number names.

Separate items to be counted.

Starting and finishing points.

Cardinality, subitising, composition.

Term	Definition	Examples and suggested resources
Comparison	**Exploring the similarities or differences between two or more items.**	"more, lots, fewer, the same" Natural materials and objects. Mathematical resources such as counters and cubes. 
Estimation	A reasonable judgment based on knowledge.	 Using knowledge of 'how many' to estimate a small number of objects. "I think there are about 8 leaves."
Counting	**Saying number names in order to find an amount.**	How many spoons? Line up, then count say "one, two, three, four." Move and count, touch and count saying the number names in order. 
Stable Order	Saying the number names as a repeated pattern. Use different starting points.	 What comes next? "Two, three, four……"

Cardinality	**Knowing the last number spoken represents how many are in the set.**		There are four apples in the bowl. “One , two, three, four…four apples.”
Subitising	Instant recognition of small quantities without saying number names in order.		“Three” Numicon, Hungarian Frames, dot patterns. Dice, dominoes, cards.
Composition	**Number structure, how numbers are built.**	Three. Counters, cubes. *1 + 1 + 1 = 3* *1 + 2 = 3* *2 + 1 = 3*	
Partition	The parts that make up a total amount.		Five can be shown as 3 and 2. Hungarian Frames, Ten Frames, Numicon. Whole part-part diagrams. 

Stories, Rhymes & Songs

Goldilocks and the three Bears

Three Billy Goats Gruff

The Button Box – Margarette S. Reid

Dear Zoo – Rod Campbell

Cat's Car – Richard Fowler

Count to 10 with a Mouse -Margaret Wise Brown

We're Going on a Bear Hunt – Michael Rosen

Flamingo Flo Walks Home – Emma Pelling

Pattern

Creates their own spatial patterns showing some organisation or regularity.

Spots patterns in the environment, identifying the pattern 'rule' Uses familiar objects to create and recreate repeating patterns beyond AB to ABC and perhaps ABB and ABBC.

Fabrics, natural resources, objects for sorting. Make Baby Bear a new blanket for his bed. Repeating patterns on a scarf.

In the Maths Zone

I Spy Numbers – Jean Marzollo

Do I have enough?

Do I need any more?

Filling jars and comparing.

How much, how many?

How much do you need?

How many have you got?

Spatial Awareness

Responds to and uses language of position and direction.

• Explores from different viewpoints and points to things that are far away

Uses spatial language, including relative terms depending on viewpoints.

• Follows and gives directions.

Directions to the three bear's house through the forest using positional words.

Shape

Chooses items based on shape so they are appropriate for specific tasks • Responds to both informal language and common shape names.

• Uses informal language and analogies, (e.g., heart-shaped and hand-shaped leaves), as well as mathematical terms to describe shapes

Forest school- leaves and sticks

Measures

Sequences a small number of familiar events and beginning to respond to and use words such as 'before', 'after', 'soon' or 'later'.

Orders and sequences events using everyday language related to time.

Beginning to experience measuring time with timers and calendars.

How many leaves can you scoop up in …?

Stories, Rhymes & Songs

Goldilocks and the three Bears

Three Billy Goats Gruff

Little Red Hen

The Enormous Turnip

The Button Box – Margarette S. Reid

Dear Zoo – Rod Campbell

Cat's Car – Richard Fowler

Count to 10 with a Mouse -Margaret Wise Brown

Pattern

Join in with simple patterns in sounds, objects, games and stories dance and movement, predicting what comes next. Body percussion. Musical instruments. Repeating movement.

Makes border patterns where the repeating pattern continues around an object or frame.

Button sorting and making frames around a picture. Conkers, acorns.

In the Maths Zone

I Spy Numbers – Jean Marzollo

I can see one

Teddy's bedroom: one of each item.

Tray with single items. Kim's game.

All About Me

1,2,3 !

Spatial Awareness

Responds to and uses language of position and direction.

Explores from different viewpoints and points to things that are far away

Lining up and saying the position. Roadways, rail tracks.

Turns and flips objects in order to make shapes fit and create models; predicting and visualising how they will look (spatial reasoning) jigsaws

Shape

Chooses items based on shape so they are appropriate for specific tasks • Responds to both informal language and common shape names. Squares circles triangles, round, pointy, straight. Pizzas for Little Red Hen.

• Uses informal language and analogies, (e.g., heart-shaped and hand-shaped leaves), as well as mathematical terms to describe shapes.

Measures

Finds the longer or shorter, heavier or lighter and more/less full of two items.

Turnip soup. Role play balance scales. Pouring into containers. Build long roads, short roads for Cat's Car.

Stories, Rhymes & Songs

None the Number – Oliver Jeffers

One Gorilla -Anthony Browne

My Mum and Dad Make Me Laugh-Nick Sharratt

One Too Many Tigers – Cressida Cowell

Too Many Carrots – Katy Hudson

Who Sank the Boat ? - Pamela Allen

The Blue Balloon – Mick Inkpen

Pattern

Join in with simple patterns in sounds, objects, games and stories dance and movement, predicting what comes next.

Spots patterns in the environment, identifying the pattern 'rule'

Firework colours & sounds, Diwali patterns. Witch's scarf design.

4 and 5

Jump & Jive!

In the Maths Zone

I Spy Numbers – Jean Marzollo

I can see two

Two shoes, two socks. Two eyes, two hands. Dressing for Bonfire night.

Matching card games. Happy families.

Spatial Awareness

Responds to and uses language of position and direction.

• Explores from different viewpoints and points to things that are far away

Fireworks in the sky, from a distance.

Uses spatial language, including relative terms depending on viewpoints.

• Follows and gives directions.

Shape

Shows awareness of similarities and differences between natural and manufactured shapes in the environment.

Forest: leaves, sticks, seeds. Jump in the leaf pile. Cutting vegetables, changing the shape.

Uses informal language and analogies, (e.g., heart-shaped and hand-shaped leaves), as well as mathematical terms to describe shapes.

Measures

Finds the longer or shorter, heavier or lighter and more/less full of two items

Solves problems involving prediction and discussion of comparisons of length, weight or capacity, paying attention to fairness and accuracy.

Rabbit has too many carrots. How can we help him?

Stories, Rhymes & Songs

How do Dinosaurs Count to 10? -Jane Yolen & Mark Teague

Cockatoos – Quentin Blake

The Very Hungry Caterpillar – Eric Carle

Sidney the Silly Who only eats 6 -M.W. Penn

Bears on the Stairs – Julia Jarman

The Jolly Christmas Postman

Pattern

Creates their own spatial patterns showing some organisation or regularity.

Arranging sweets into threes. Repeating patterns. Pick and mix into bags.

Begins to identify the core unit in a repeating pattern and beginning to use symbols.

Draw the core unit from their patterns. Print/paint patterns such as triangles.

In the Maths Zone

I Spy Numbers – Jean Marzollo

I can see three.

Three in stories.

Triangles, three toys. Finger patterns.

Pick and Mix, Number 6!

Spatial Awareness

Predicts, moves and rotates objects to fit the space or create the shape they would like.

Christmas parcels to be organised and sorted.

Engages with 3D & 2D map-making in familiar environments, sequencing landmarks and designing small worlds

Follow the postman's journey on a map

Shape

Partitions and combines shapes to make new shapes with 2D and 3D shapes.

Different shaped parcels for None the Number.

Composes and decomposes shapes, learning which shapes combine to make other shapes.

Christmas card jigsaws.

Measures

Sequences a small number of familiar events and beginning to respond to and use words such as 'before', 'after', 'soon' or 'later'.

Plan a toy's Christmas party. What will happen?

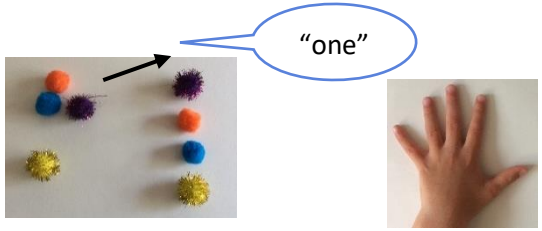
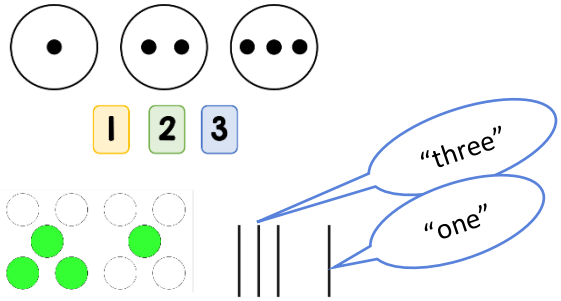
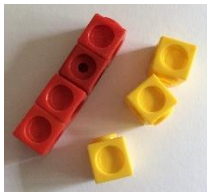
Orders and sequences events using everyday language related to time.

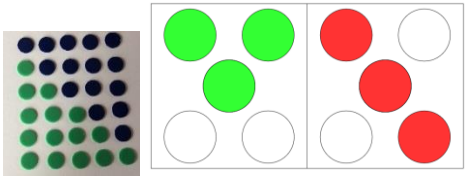
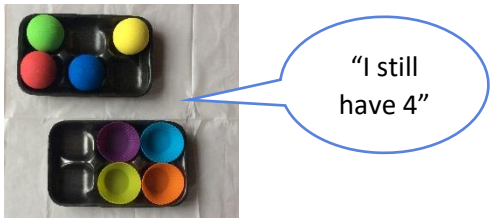
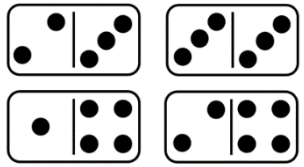
Beginning to experience measuring time with timers and calendars.

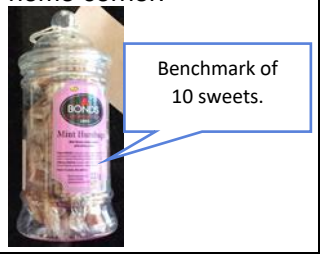
Birthdays, celebrations, seasons.

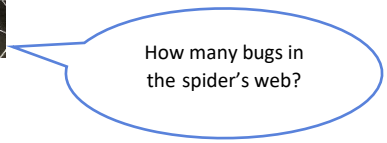
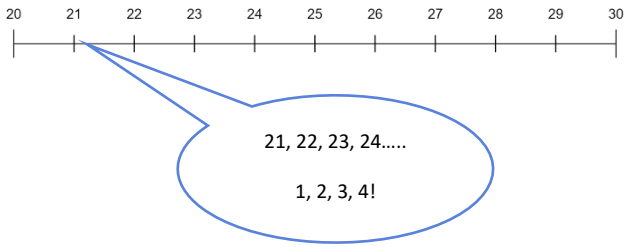
Range 5	What the child is learning	Fluency	Reasoning	Problem Solving
	Comparison Compares two small groups of up to 5 objects, saying when there are the same number of objects in each group.	Sharing items.  Knowing when quantities are equal, unequal "not fair shares". Adults modelling language appropriate to number: "I have lots." "How many?"	  Is it true that we have the same number of cars? Show me that you have more counters/shells than me.	**Small world play,** Are there lots of sheep in the field? (offer different quantities) How many cars can you fit on the road? **Role play area.** Birthday party, counting the cups, bowls, spoons. How many children can play in the sand? Lots?
	Counting Enjoys reciting numbers from 0 to 10 and back from 10 to 0. Has fun counting as far as they can go and is fascinated with large numbers.	Number rhymes: 1,2,3,4,5 Once I Caught a Fish Alive, 1 Little Elephant Went Out to Play. 1,2, Buckle My Shoe. Songs: *I can see apples high up in a tree.* Stories: Count to 10 with a Mouse. Blast Off! Encouraging participation, say the rhymes, sing the rhyme. Join in with the repetition.	When singing, question what number is going to come next? "1,2,3, *pause* 5." What number did the puppet miss out? Making up own  gestures/actions to songs/rhymes that match the rhyme.	This **jigsaw** has 6/8/10 pieces, how are we going to check that they are all here? Join in with counting in **games** such as hide and seek or ten tiny steps, ten giant steps. Ten Green Bottles skittles game.

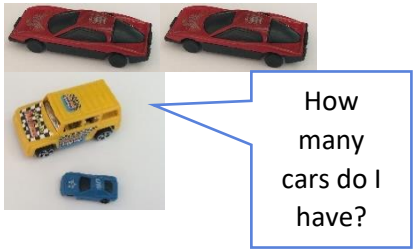
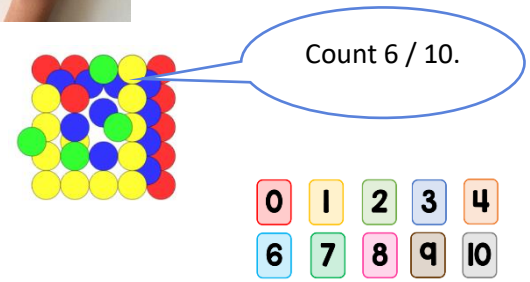
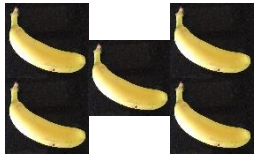
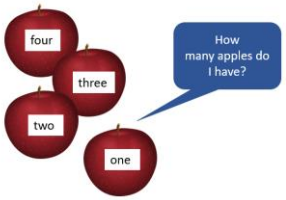
	Shows interest in meaningful numbers. 'Tags'(reliably points or touches each items), saying one number for each item, using the stable order of 1,2,3,4,5 at first, and then later to 10. Uses some number names and number language within play. Begin to recognise numerals 0 to 10 and some beyond	Routines that require counting for a purpose. How many children are here today? How many children can play in the water? "How many leaves are here?"  Say the number names to 10 in order. Songs, rhymes and stories to 10. Say number names beyond 10.  Continue to recite number in order. Beginning to count beyond 10) Counts objects to 10. Natural and manmade materials. Number rhymes, 1,2,3,4,5 emphasise the 5 showing 5. Say number name when touching finger/chin. Model how we can keep track of a count. Teddy race making a mark on the board after 1 lap, using numerals. 	Numerals for labels. How will we know if all the pans are put back in the mud kitchen? Bear is having a tea party. He has invited 6 friends. How can we make sure he has enough cups for his friends?  Playdough It is Bear's birthday, he needs 5 candles on his cake. Can you help? 4 of the friends travel by bus. Has the bus got enough places for everyone to sit? (Chairs set out as a bus) "7 people visited our museum today, show the book with 5 marks. Is this true?" "Prove to me that Katie did 6 laps on the track today."	Role play making phone calls and lists of numbers, appointments at the vets etc. Traffic control – "How can keep track of how many laps our friends have done?" (provide a range of mark making materials, e.g. whiteboards, blackboards, clipboards) Role play mark making, "5 people have booked in for lunch. How can we record that in the book?" "How can we tell the chef what he needs to cook?" "4 dogs have been booked into the vets today, this needs recording in the appointment book." "Find the sea creature in the water. How can you tell a friend how many that you have found?" "Pirate Pete wants to know how much treasure he has. Count the treasure so that he knows how many coins and jewels he has.

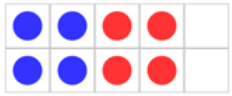
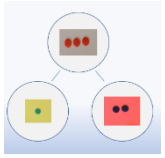
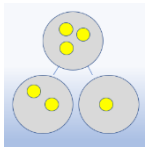
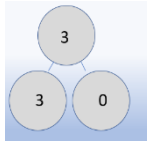
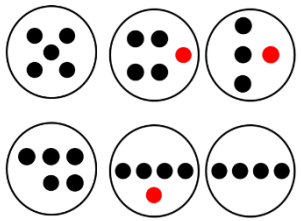
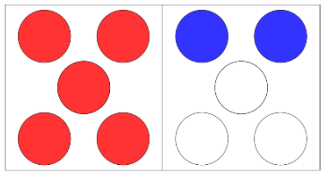
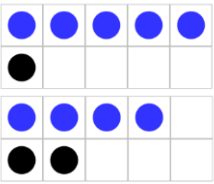
	Cardinality Subitises: e.g., instantly recognising under 5 objects without counting. Recognises that the last number said represents the total counted so far (cardinal principle) with numbers to 5 and maybe beyond. Shows 'finger numbers', up to 5 and maybe beyond. Links numerals with amounts up to 5 and maybe beyond. Explores using a range of marks and signs to which they ascribe mathematical meanings.	Quantity and number name match. Saying number names and matching it to the quantity at the same time.  Let's count out 5 buttons. Careful modelling of counting out a given quantity and stopping at a required number. Moving objects when counting.  Emphasis the final number, with a closing gesture. Use intonation in voice when counting. 	I have 6 cars, is this true?" (actual number of cars is 4) "Prove to me that there are 4 bears in the basket." "Goldilocks says that she has 5 porridge spoons, is that true?"  I have 6 buttons, 5 cars, 3 oranges, choose a set to record."  How do they represent? Lines, drawing? Make marks to show 1 to 5 	"I think that there are some spoons missing from the mud kitchen, there should be 5. How can we check?" "To make a tower I need 4 red blocks and 3 yellow blocks, have I got enough of each colour to make 2 towers?"  "I have 6 pieces of apple, are there enough for everyone? Or do I need another apple? If so how many more pieces do I need?" Play a game, e.g. bean bag in a hoop. "If you throw the bean bag in the '4' hoop how will you represent your score?" "If you knock down 3 skittles, how can you record that?"

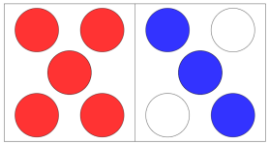
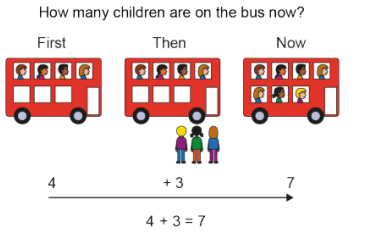
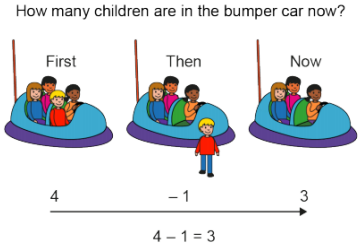
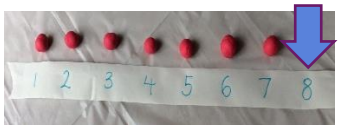
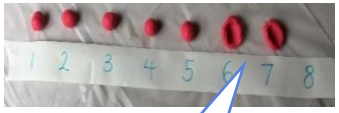
	Composition In their play and exploration children are beginning to learn that numbers are made up (composed) of smaller numbers. Beginning to recognise that each counting number is one more than the one before. Separates a group of three or four objects in different ways, beginning to recognise that the total is still the same.	*To be spoken*… 0 and 5 makes 5 1 and 4 makes 5.. 2 and 3 makes 5.  Compare fruit at snack time, "I have 5 satsumas and 5 apples so I have the same number in each fruit bowl."  Decorating a cake, 3 on 1 side and 1 on the other. Change the arrangement and keep proving that the total is the same. 	3 or 4 raisins on the plate, you can't take any off and you can't add any more. Find ways to decorate the plate.  Stable Order. "I have five apple. If I get one more, I now have 5 and one more. How many do I have?" Show me. 4 owls to go in 2 nests, I have found 2 ways to do it. Are there anymore?  Place 3 or 4 buttons on the jumper in as many ways as you can. Prove to me that the total is still the same.	4 animals have escaped from the farm. Can you find them? Put the animals safely back in the 2 pens. How many are in each pen? Move 1, is that still 3? 4? 4 cars need to park in the carpark, where can they park? Can you find another way? Do they understand that the total is still the same? Only the cars with five dots can park in car park number 5.  Jewellery sorting for the shop. Making bracelets using hoop cereal. "All of the bracelets with the same number of hoops go together." "All of the bracelets with 7 go together."

Range 6	What the child is learning	Fluency	Reasoning	Problem Solving
	Comparison Compares number names and symbols, showing interest in large numbers. Makes reasonable estimates of numbers of things, showing understanding of relative size.	Numbers in the environment - labels, coats, aprons, home corner, snack table, bikes (link to quantity) Birthday cards with numerals on. Linking it to their own age. Numbers in own environment on houses, phones, car registrations, buses, clocks.   I have some pinecones and some shells. How many of each do you think I might have? 	"I have 8 bus tickets, (numbered 1-8) The bus has 8 labelled seats. Prove to me that the passengers are sitting in the correct seat." Have toys sitting in the incorrect spaces. "Prove to me that they are in wrong places." 4 biscuits on a plate and 5 on another. Label incorrectly and ask the children to convince you that the labels need to be the other way around. *How do you know?* *Are you sure?* *Can you show me?*	Car number 3 can only park in space number 3 and car number 5 can only park in space number 5. (Have cars without numbers on) where can this car park? "Here are 5 number cards for the parking spaces, here are 5 cards for the scooters – you decide where they go." A mixture of envelopes with a range of numbers on. Can you post the envelopes into the correct boxes? Matching numerals on envelope and boxes. Jars of pasta or sweets for estimation in the home corner. 

	Counting Counts items beyond 10. Puts numerals in order, 0 to 10 and sometimes beyond. Counts verbally from 20, beginning to spot repeating patterns.	Say the number names to 20 in order.   Songs, rhymes and stories to 20. Say number names beyond 20. Continue to recite number in order. Beginning to count beyond 20. Counts objects to 20. Natural and manmade materials. Counting out a given set e.g. given 14 counters, count all.  	Convince me that I have 20 dinosaurs in my bag. I think that we have 19 children in the group today. Is that true? I think that 20 children are having sandwiches today. Can you prove it? I know when I am counting, I say 12,14,15, 17, 18. Have I got that right? Convince me that I have 10 sweets in my bag. I think that we have 14 children in the group today. Is that true? I think that 11 children are having sandwiches today. Can you prove it?	Up to 20p Shop. Can you pay for items using 1p coins from 10p-20p? In construction, how many different models can you make using 15 bricks, 17 bricks, 20 bricks. Using the farm small world play. There should be 10 sheep, 6 pigs and 7 cows today on the farm. Can you check that no animals are missing? In construction, set a challenge to create different structures using exactly 20 bricks How many fish have you caught today? 

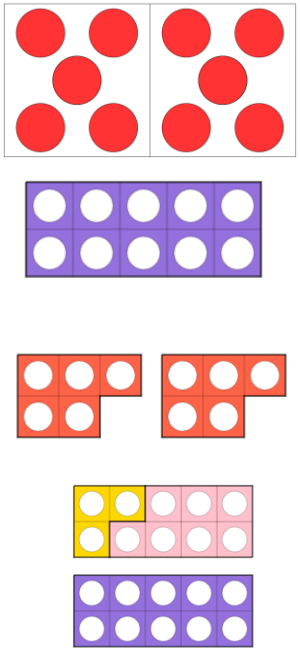
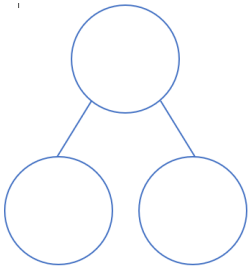
	Cardinality Subitises numbers to 4 or 5. Having counted, says the total (cardinal principle). Counts out up to 10 objects from a larger group. Selects the correct numeral for up to 10 objects.	 Move and count. Touch and count from a group of up to 10 objects. What will I say next? 1,2,3 ..? How many fingers on my hand?  	**Counters/cubes to 5.** "I have 5 cubes, you have 3. What will you do so you have the same as me?" I have 5 bananas. Arrange them so that you can see 5.  Convince me that this numeral matches this quantity.  Nick the number thief has mixed up Flamingo Flo's numbers. Convince me that they are back in the correct order.	 Make leaf jigsaws.  Make leaf Pelmanism.  In their play look for opportunities to subitise to four/five.

	Composition Shows awareness that numbers are made up (composed) of smaller numbers. Conceptually subitises larger numbers by subitising smaller groups within the number, e.g., sees 6 raisins on a plate as 3 and 3. Partitions a number of things in different ways, including when problem solving and talks about the ways a number can be made. Adds one and subtracts one, with numbers to 10 and uses some addition and subtraction vocabulary in practical activities.	 4 and 3 total 7.       	I have six ladybirds and 10 leaves. Show me that I can sit a ladybird on their own leaf.  I have rolled a 5 on the dice and I have counted out these cubes. Am I correct? (have the correct and incorrect amounts) I roll two dice. How many cubes should I collect altogether? I think I can arrange 7 cars in 4 ways. Is that true? 	6p land Everything is 6p, count out the correct number of pennies to pay for the items.   Molly Mouse has a packet of crackers she wants to put out 8 for her friends on two plates. How can you help? I have 10 sweets and want to eat the red ones first. (4 red sweets) How many do I have? How many are blue?

	Children begin to explore and work out mathematical problems, using signs and strategies of their own choice, including (when appropriate) standard numerals, tallies and "+" or "-"	 5 + 3 = 8  7 + 1 = 8  8 = 5 + 3  	Teaching children to count back Subtraction squish game *for show me.*   Using play such as road play mats to drive and park cars, creating scenarios for adding and subtracting. Is it true that ….? I start at 6 and count on 4, so the answer to 6 +4 = 9 What mistake have I made? I start at 9 and count back 3 so the answer 7. Have I made the same mistake?	Outside track game to go along the route. The children are the counters, roll a large dice. E.g., I am standing on 4, I roll a 4 do I land on 8 or 9. Bean bag game. Throw bean bags into the hoops, to find the score add the beanbags together. "I was playing subtraction squish, I put my arrow on 10. I counted back and landed on 4. What number did I take away?" "First there were 6 children on the bus. Then two more children got on. Now there are 8 children on the bus."

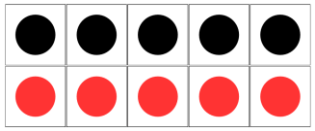
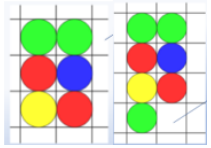
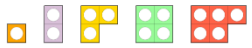
Reception: ELG Number 2021

- Have a deep understanding of number to 10, including the composition of each number; - Subitise (recognise quantities without counting) up to 5; - Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

Representations	Key knowledge and vocabulary	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
	Number structure. Equality, inequality. Partitioning and recombing. Subitising to 5. 5 as an anchor. Knowing representations for 10. 5 + 5 = 10. Modelling the combining of values to make 5 and 10. Using recall strategies and subitising to identify the number of concrete/pictorial objects in the set. Recall number facts and relationships 10 = 8 + 2 10 = 2 + 8	Natural materials, physical objects and mathematical resources to subitise to 6. Then group to 10. Resources that match a numeral to a quantity within a mathematical model. Whole part/part diagrams to represent values with images then numerals. 	Represent a quantity by drawing or by using graphics. (using drawings to show a resource) Mark making and graphics to represent numbers to 10 and beyond in their play. Graphics and attempts at numerals in the correct orientation. Mark making and numerals to replicate the concrete and pictorial model. Graphics and numerals to show the addition facts.	Mud kitchen play: problem solving 'Let's put 6 cups of mud in the pan.' 'Now put 4 cups more in the pan.' How many cups of mud are in the pan?' Construction play: problem solving Make houses with 10 bricks in different ways. e.g. *7 bricks tall then 3 bricks for the roof.* Spot and use opportunities for children to apply number bonds: "There are 6 of us but only 2 clipboards. How many more do we need?"

Reception: ELG Numerical Patterns 2021

- Verbally count beyond 20, recognising the pattern of the counting system; - Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Representations	Key knowledge and vocabulary	Concrete & pictorial Conceptual modelling	Abstract Skills and knowledge	Application across the environment
    	Number structure. Doubles to 5 + 5 Recognising doubles with a variety of models. Modelling the combining of equal values to make doubles up to 10. Using recall strategies and subitising to identify the number of concrete/pictorial objects in the set. Recall doubles facts 1 + 1 =2 2 + 2 = 4 Recognise odd and even numbers using grouping in twos to find the 'left over' when the number is odd, no 'leftover', when the number is even.	Natural materials, physical objects, and mathematical resources in different sizes e.g., counters in all environments to count accurately. (cardinality). To show doubles in nature. Resources that match a numeral to a double quantity. To show odd and even numbers Models of mathematical counting resources to show equal and unequal quantities. Using a number track or line to show odd and even numbers.	Represent a quantity by drawing or by using graphics. (using drawings to show a resource) Mark making and graphics to represent doubles/odds and evens to 10 and beyond in their play. Graphics and attempts at numerals in the correct orientation. Mark making and numerals to replicate the concrete and pictorial model. Graphics and numerals to show the number facts and patterns.	Exploring in play: problem solving 'Let's use the odd and even number lines to explore….' Farm set Dolls House Car mat Role play: problem solving. Dotty Double's Shop. *Buy 3 you will get 6* Odd and even hunt: Find items in the environment. *3 shells are odd, and 2 fish are even*.