Our School Vision Statement: *At Crookham Infant School we aim to make learning irresistible so that as Team Crookham we all develop the life-long learning habits of resilience, resourcefulness, reflectiveness and reciprocity through exploring together the loving invitation of Jesus to 'live life in all its fullness' John 10:10.*
Our vision stems from our Christian foundation and is firmly rooted in our values: ***Love God, Love Others, Love Learning.***

	Reflective Owl	Resourceful Squirrel	Team Ant	Tough Tortoise
YR	 • *I can tell you what a learner is like I am motivated to explore and find out more* • *I can tell you what I am good at and what I want to get better at* • *I can ask questions and sometimes change my mind in response* • *I can sometimes suggest a solution when talking together to problem solve* • *With support I can plan my learning and make improvements*	 • *I know the class routines and am beginning to know what I am learning* • *I can sustain my attention over time especially when I have chosen the task* • *I can select resources for the task or because I am interested in them* • *I can use a range of large and small resources on my own or with others* • *I can talk about what I am learning with some specific vocabulary and listen to other ideas or instructions*	• *I can learn on my own or with others with just a little support* • *I can work in a pair or group with a little support* • *I am beginning to ignore distractions when I am learning* • *I usually make good choices even when others are distracting* • *I almost always treat others with respect using Kind Words, Kind Hands, Kind Feet* • *I can respond well to other ideas and instructions*	• *I often try myself before asking for help* • *I can focus on some tasks and sustain my involvement* • *I recover from my mistakes and accept some suggestions to change approach,* • *I recover quickly from most disappointments* • *I am beginning to enjoy challenge in my learning (being in the pit)* • *I practise until I master some skills and like to finish I task I start*
Y1	• *I know how I learn best* • *I am motivated to learn for myself and to support others* • *I can ask general questions and decide on an enquiry question* • *I know what I am good at and have an idea of what I can't do yet* • *I use talk to refine my ideas* • *I can plan my learning before I start* • *I can respond to ideas to help me improve my learning*	• *I can use tools (like a visual timetable) to know what I am learning and what is coming next* • *With a little support I can prepare for my learning and make good use of learning time* • *I can select the resource I need for a task and use them safely* • *I can use a wider range of learning resources and vocabulary specific to a subject* • *I listen to others and to instructions*	• *I can usually decide when it is better to work on my own or with others* • *I can usually choose a good partner or group to learn with* • *I understand that sometimes I am the leader and sometimes not* • *I can ignore most distractions and usually make good choices* • *I understand other people's feelings and use Kind Words, Hands, Feet* • *I almost always respond with a good choice*	• *When I start a task I can focus and stay on track* • *I have some strategies to problem solve in my learning* • *I learn from mistakes and can cope with some disappointment* • *I often like to challenge myself and work hard to get out of the learning pit* • *I am getting better at practising until I master new skills and take pride in finishing a task well.*
Y2	• *I always take responsibility for my own learning* • *I am highly motivated to learn and master new things* • *I ask a number of enquiry questions before refining my enquiry focus* • *I can explain in detail what I can and can't do yet* • *I can explain precisely what I am finding difficult in my learning* • *I use talk well to reflect and refine my thinking* • *I make a detailed learning plan* • *I edit and improve before needing support*	• *I always make sure I know what I am learning now and what is next* • *I am well prepared for my learning* • *I am selective over the resources I use choosing what is appropriate for the task* • *I am confident using a range of subject specific resources and vocabulary* • *I am responsible and safe with resources using Kind Hands* • *I know that people are a great resource and listen carefully to ideas and instructions*	 • *I make great decisions about when to work independently or collaboratively* • *I can recognise what makes a good learning partner* • *I work well in a pair or a group where I can cope with being the leader or not the leader* • *I can ignore distractions and make independent choices* • *I treat others with respect using Kind Words, Hands and Feet* • *I always listen to others' ideas and instructions and respond appropriately*	• *I can start my learning independently* • *I maintain great focus and sustain it over time* • *I have developed strategies which help my learning* • *I learn from mistakes and can cope with disappointment* • *I challenge myself in the learning pit and expect to work hard* • *I have high expectations of myself and enjoy achieving well*  • *I keep practising, make edits and improve work* • *I take pride in the learning journey as well as my finished outcomes*

Curriculum Intent for Mathematics at Crookham Infant School

The curriculum at Crookham Infant School is designed so that all pupils develop the learning habits of reflection, resourcefulness, reciprocity and resilience. They learn to apply these characteristics of learning effectively across all subjects and curriculum areas whilst at Infant School and continue to develop them in lifelong learning which in turn allows them to live life in all its fullness.

In Mathematics we teach to achieve depth or 'mastery' for all pupils, drawing upon the research of the Education Endowment Fund (EEF) and their recommendations.
The intention of our Mathematics curriculum is to ensure depth in conceptual understanding as children progress in acquiring mathematical fluency, reasoning and problem-solving skills. So that our pupils know and remember more, we plan and sequence learning in small steps of progression through concepts, utilising a concrete, pictorial, abstract approach. Within our mixed attainment classes, we scaffold mathematical learning and provide timely feedback, intervention and directed support. Children who grasp concepts quickly are given opportunities to construct and apply knowledge. They question, justify and prove, so deepening their fluency, reasoning and problem-solving skills within the content and context where children can demonstrate their substantial knowledge and disciplinary skills. All children appreciate working collaboratively in Mathematics, as Team Ant, and relish learning from and with their peers. They value Maths that is meaningful, explores their environment indoors and out, and is relevant to their developmental schema, interests or curiosities. They expect mathematical learning to be engaging, enjoyable and 'challenging learning', providing them with opportunity to demonstrate reflection like Owl, resourcefulness like Squirrel, or resilience like Tortoise as new concepts 'hills or pits' are encountered on the learning journey.

Curriculum Design and Implementation for Mathematics at Crookham Infant School

We teach the National Curricula for Early Years Foundation Stage and for Key Stage One. We do not follow a particular scheme of work for materials or rate of coverage, but do draw from quality researched resourcing where appropriate. We utilise NCETM documents to inform our pedagogy and guide teacher subject knowledge so that learning is planned to meet the needs of all pupils. Teachers make informed judgements about children's readiness to progress. Small steps in both conceptual and procedural understanding are planned for, with consideration given to addressing the common misconceptions which are likely to occur. Teachers plan to cover all areas of the curriculum within the school year, building flexibility into long, medium – term and short-term planning so that they can teach concepts to an appropriate depth of understanding for the vast majority of the group before moving on. Gaps in learning are identified and addressed promptly, with same day intervention wherever possible. Concrete, pictorial and abstract models are used to support learning for all our pupils. In line with EEF research, we teach to develop efficiency and fluency in mathematical understanding using a range of manipulatives and representations, before moving learning to procedural methods. We pay particular attention to the role of Subitising in developing calculation in order to prevent over-reliance on inefficient 'counting on' methods, understanding that mathematical fluency is not mere speed but rather an efficient choice of strategy.

Mathematics learning in each year group at Crookham Infant School builds on prior skills, knowledge and understanding so that children develop the strong foundation of number sense, pattern and relationships on which mastery in all maths is built. Our progression documentation shows the likely learning trajectories of each strand of mathematics taught, drawing from the research and recommendations of EEF, NCETM and Learning Trajectories - the work of Clements and Sarama in particular.

Maths learning at Crookham will typically include:

- A problem focussed on procedural fluency or reasoning – links to prior learning, review and consolidation of a concept, pattern, relationships or connections in maths.
- Activating our learning habits – Owl, Squirrel, Ant or Tortoise to decide how prior learning, knowledge and skills will help us form a strategy to tackle this task
- Pre-teaching a concept, skill or procedure in order to prepare for new learning.
- A hook problem or calculation where children can work as Team Ant (collaboratively) to share ideas and initial strategies
- A series of activities with direct instruction, collaborative learning and dialogue to unpick the idea around which the learning is based.
- Independent working, including practise of a skill, progressing to trial and error within a concept and reasoning around an idea (critical Owl thinking).
- Looking at a well understood concept in a different context, applying different reasoning to embed deep understanding in long term memory.

- Identifying children who would benefit from further support, breaking a concept into smaller steps, providing additional scaffolding in resource or time, and removing this scaffolding when confidence and independence can be achieved.
- Addressing misconceptions, self or peer review, assessing the learning within the session and where it fits within the larger unit of learning.
- Intervening to address the misconception or fill a gap before moving on.
- Using mistakes positively to move learning on and unpick thinking to deepen understanding and promote further independence.
- Marking/Feedback allowing children to complete, correct and go deeper in their learning.
- Well timed return and repetition to concepts over and over in order to apply them in different contexts and deepen learning.

The above would be seen in learning over time. We would not expect to see all elements within one learning session.

Curriculum Impact for Mathematics at Crookham Infant School

Children understand the relevance and importance of their mathematical learning in relation to real world concepts, and how the knowledge and skills learnt will form the foundation for life-long learning and living life in all its fullness. Children have a positive view of maths due to learning in an environment where maths is promoted as being an exciting and irresistible subject in which they can be investigate and ask questions. Through our learning habits of reflection, resourcefulness, reciprocity and resilience children develop the skills needed to be confident, efficient and reflective mathematicians. Like Tough Tortoise they know that it is reasonable to make mistakes because this can strengthen their learning through the journey to finding an answer. Children are confident to 'have a go' and like Resourceful Squirrel choose the equipment they need to help them to learn, along with the most efficient strategies they think are best suited to each problem. Children are curious and engaged like Reflective Owl and realise they know more and can do more. They develop the ability to recognise relationships and make connections in maths lessons. Our children are proud of what they have achieved and are prepared for the next part of their journey.

Long Term Planning LTP Mathematics

See Medium Term Planning MTP for more detail.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year R Number	**Place Value** To show numbers to 5 using concrete resources such as fingers. To know some numbers and can match some numerals and quantities to 5. To say one number name for each item to 5 when counting.	**Place Value** To count to 5 using different mathematical resources. To know numbers to 5 and can match numeral and quantity to 5. To know how many are there through subitising up to 5 objects (perceptual subitising and beginning to use conceptual subitising – I know there are four because	**Place Value** To count sounds, claps, movements, objects to 10 To know numbers to 10 and can match numeral and quantity. To notice when the amount (10) changes or stays the same – equal/more/fewer/less **Addition**	**Place Value** To recognise different amounts (to 10) shown on a tens frame. **Place Value/Addition and Subtraction** To use part/whole models to show the composition of numbers to 5 and give more than 1 composition for each number.	**Addition and Subtraction** To use part/whole models and conceptual subitising to show the composition of numbers to 5-10 and give more than 1 composition for each number. To know some addition and subtraction number facts to 5.	**Place Value** To recognise the numerals to 10 and match to quantity consistently To recognise quantities up to 5 using different arrangements and resources by subitising. **Addition and Subtraction**

	To know how many are there through subitising up to 3 objects (perceptual subitising). To solve some simple problems with numbers to 5 eg I have 4 cakes but want 1 more.	I can see a 2 and a 2), To recognise the above using different objects and arrangements. Notice when the amount (5) changes or stays the same – equal, more/fewer/less.	To recognise the different composition of numbers to 5 (addition facts) using conceptual subitising e.g I know it is 5 because I can see a 4 and a 1, and know there is more than one way of doing this – I know it is 5 because I can see a 3 and a 1 and a 1. To recognise the above using different objects and arrangements.	**Addition and Subtraction** To start to identify addition facts and linked subtraction facts using subitising and a tens frames. - I can see a 5 and a 1 so that must be 6. If I had 6 and took 1 away I would have 5 left.	**Multiplication** To start to recall some double facts e.g. 1 and 1 is 2	To show the composition of numbers to 10 using different models e.g. part whole, tens frame, conceptual subitising. To recall number facts up to 5 and some to 10 To match subtraction facts with number facts. **Multiplication** To recall some double facts within 10 **Division** To share equally.
Year R Numerical Patterns	**Place Value** To know the order of numbers to 5. To count to 5 reliably. To start to count beyond 5. To start to compare quantities using non-standard vocabulary. **Pattern and mathematical relationships** To start to continue and copy patterns.	**Place Value** To know the order of numbers to 10. To count to 10 by rote. To compare manipulatives (e.g. saying when one tower is bigger/smaller). **Pattern and mathematical relationships** To compare two quantities saying when one is bigger/smaller/same	**Place Value** To find one more/ one less using resources. **Pattern and mathematical relationships** To continue and copy patterns. To create own patterns	**Place Value** To know the order of numbers to 20. To say a number that is one more/ less without resources. **Pattern and mathematical relationships** To spot errors in the pattern. To name patterns e.g. ABAB .	**Place Value** To count to 20, knowing the teen numbers To start to identify odd and even numbers linked to sharing. To know some double facts and can recognise the pattern within these. To know some odd and even numbers by recognising the pattern within numbers.	**Place Value** To count beyond 20. To compare quantities using greater/ more than, fewer/ less than, the same/ equal. **Pattern and mathematical relationships** To show patterns in numbers to 10 To talk about odd and even numbers. To say double facts. To share equally.

Year 1	**Number – Number and Place Value** To identify and represent numbers using concrete objects and pictorial representations. To use the language of equal to, more than, less than, most, least. Through grouping and sorting objects. To count forwards and backwards to and from 20 and write them numerically. To be able to identify one more and one less than a given number to 20. To identify which groups have more or less, and to use more and less than symbols accurately. To compare and order numbers from 0 up to 20, use <, > and = signs.	**Number – Addition and Subtraction** To represent and use number bonds and related subtraction facts to 10. To add and subtract to 10 by: adding parts to find the whole. Finding a missing part. Finding fact families. To partition numbers into 2 or more parts. To read, write and interpret mathematical statements involving addition, subtraction and equals signs. To solve one-step problems that involve addition and subtraction to 10 using concrete objects and pictorial representations and missing number problems. **Geometry – Properties of shapes** To recognise and name common 2D shapes. (Rectangles (including squares), circles, triangles. To recognise and name common 3D shapes (Sphere, cylinder, cuboids (including cubes), pyramids).	**Number – Addition and Subtraction** To add 1-digit and 2-digit numbers to 20, including zero. To represent and use number bonds and related subtraction facts within 20. To count on from a given number and explore the relationship with addition, using a number line. To use number bonds to 10 to help us with number bonds to 20. To solve one-step problems that involve addition to 20. **Measurement** To measure and begin to record the following: length and height, using non-standard and standard measure. To compare, describe and solve practical problems for: lengths and heights (long/short, longer/shorter, tall/short). To compare, describe and solve practical problems	**Number – Number and Place Value** To count forwards and backwards to 50. To count read and write numbers to 50 in numerals. To explore place value and use the terminology of tens and ones, and demonstrate my understanding of what these are. **Number – Addition and Subtraction** To count back from a given number and explore the relationship with subtraction, using a number line. **Number – Multiplication** To count in multiples of 2 and 5. ,	**Number – Multiplication and Division** To solve one-step problems involving multiplication, by calculating the answer using concrete objects and pictorial representations. For example: Using simple arrays, making doubles. To solve one-step problems involving division, by calculating the answer using concrete objects and pictorial representations. For example: Making equal groups, sharing equally, finding halves, finding quarters. To count in multiples of 2, 5 and 10. **Number - Fractions** To recognise, find and name a half as one of two equal parts of an object, shape, quantity. To recognise, find and name a quarter as one of four equal parts of an object, shape, quantity.	**Number – Number and Place Value** To count forwards and backwards to 100. To count read and write numbers to 100 in numerals; **Measurement** To sequence events in chronological order using sequential language. To recognise and use language relating to dates, including days of the week, weeks, months, years. To tell the time to the hour and half past the hour and draw hands on a clock face to show these times. To measure and begin to record time (Hours, minutes and seconds) To recognise and know the value of different denomination of notes and coins. **Geometry – Position and Direction**

		To recognise and create repeating patterns with objects and shapes. **Measurement** To use, identify and write ordinal numbers. .	for: mass/weight (heavy/light, heavier than, lighter than). To measure and begin to record the following: mass/weight. To compare, describe and solve practical problems for: capacity and volume. (full/empty, more than, less than, half, half full, quarter) To measure and begin to record the following: capacity and volume.			To describe position, direction and movement, including whole, half, quarter and three-quarter turns.
Year 2	**Number - Number and place value** To compare and order numbers from 0 up to 100; use <,> and = signs. To read, write and recognise numbers to 100. To partition two-digit numbers into different combinations of tens and ones. To explain their thinking verbally, in pictures or using apparatus. **Number – Addition and Subtraction**	**Number – Addition and Subtraction** To add and subtract two-digit numbers and ones and two-digit numbers and tens, explaining their method verbally in pictures or using apparatus. Bridging 10s. Develop a knowledge of independent bridging of tens, with numbers below 50 Develop a knowledge of independent bridging of tens, with numbers above 50. **Multiplication** **Representing equal groups**	**Multiplication and division** **Times tables, groups and commutativity** To count in steps of 2, 3 and 5 from 0, and in in tens from any number, forward and backward. To recall multiplication facts for 2, 5 and 10. To demonstrate an understanding of commutativity. To use these facts to solve problems independently. **Multiplication and division** **Doubling and halving - commutativity**	**Number - Number and place value** To read and write numbers in words to 100. To use place value and number facts to solve problems. **Introducing fractions** To begin to identify ¼, 1/3, ½, 2/4, ¾ of a number or shape, and know that all parts must be equal parts of a whole. **Geometry: Properties of shape**	**Number – Addition and Subtraction** **Adding two-digit and two-digit numbers.** To add any 2 two-digit numbers using an efficient strategy, explaining their reasons verbally, in pictures or using apparatus. **Number – Addition and Subtraction** **Subtraction two-digit and two-digit numbers** To subtract any 2 two-digit numbers using an efficient strategy, explaining their reasons	**Revisit**

	Bridging 10 To bridge ten when adding and subtracting using known number facts, demonstrating this using pictures or apparatus. For example, 7+8: 7+3=10 10+5=15 **Number – Addition and Subtraction** **Subtraction as difference** To understand the relation between addition and subtraction To use addition to work out the difference between numbers in order to subtract, and understand this is a function of subtraction. **Number – Addition and Subtraction** **Two digit and single digit numbers**. To add and subtract two-digit numbers and ones. And two-digit numbers and tens, where no regrouping is required. Explain thinking verbally, in	To understand that multiplication represents equal groups. To understand that repeated addition represents equal groups. **Groups of 10 and 5, factors of 1 and 0.** To recall multiplication facts for 10 and 5. To understand the factors 0 and 1. **Measurement** To be able to read scales in division of ones, two's, fives and tens. To read a scale from zero. To understand standard measurement.	To use doubling and halving facts within problem solving tasks. **Multiplication and division Division** To understand division as making equal groups. To understand division as sharing. To use division facts for 2, 5 and 10 to solve problems independently. To develop an understanding of how multiplication can support division. **Measurement** **Time – tell and show the time** To read the time on a clock to the nearest 15 minutes. **Measurement** **Money** To understand the value of money and use different coins to make the same amounts. **Statistics**	To name and describe properties of 2D and 3D shapes, including number of sides, vertices, edges, faces and lines of symmetry.	verbally, in pictures or using apparatus. **Fractions** To identify $\frac{1}{4}$, 1/3, $\frac{1}{2}$, 2/4, $\frac{3}{4}$ of a number or shape, and know that all parts must be equal parts of a whole.	

	pictures or using apparatus. For example, 23+5, 29+1, 67+20. **Multiplication and division** **Doubling and halving** To recall doubling and halving facts. **Measurement – Time intervals** To use routines when reading and understanding time, and to understand the uses of a clock.		To interpret and construct simple pictograms, tally charts, block diagrams and simple tables. To ask and answer simple questions, through interpreting the data.			

What happened before (Nursery etc)

- Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').
- Recite numbers past 5. Say one number for each item in order: 1,2,3,4,5.
- Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').
- Show 'finger numbers' up to 5.
- Link numerals and amounts: for example, showing the right number of objects to match the numeral, up to 5.
- Experiment with their own symbols and marks as well as numerals.
- Solve real world mathematical problems with numbers up to 5.
- Compare quantities using language: 'more than', 'fewer than'.
- Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners'; 'straight', 'flat', 'round'.
- Understand position through words alone – for example, "The bag is under the table," – with no pointing.
- Describe a familiar route.
- Discuss routes and locations, using words like 'in front of' and 'behind'.
- Make comparisons between objects relating to size, length, weight and capacity.
- Select shapes appropriately: flat surfaces for building, a triangular prism for a roof, etc.
- Combine shapes to make new ones – an arch, a bigger triangle, etc.
- Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper.
- Use informal language like 'pointy', 'spotty', 'blobs', etc.
- Extend and create ABAB patterns – stick, leaf, stick, leaf.
- Notice and correct an error in a repeating pattern.
- Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'

What happens next (Y3)

Place Value

- count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
- recognise the place value of each digit in a 3-digit number (100s, 10s, 1s)
- compare and order numbers up to 1,000
- identify, represent and estimate numbers using different representations
- read and write numbers up to 1,000 in numerals and in words
- solve number problems and practical problems involving these ideas

Number - addition and subtraction

- add and subtract numbers mentally, including:
  - a three-digit number and 1s
  - a three-digit number and 10s
  - a three-digit number and 100s
- add and subtract numbers with up to 3 digits, using formal written methods of columnar addition and subtraction
- estimate the answer to a calculation and use inverse operations to check answers
- solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction

Number - multiplication and division

- recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables
- write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
- solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects

Number - fractions

- count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10
- recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators
- recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
- recognise and show, using diagrams, equivalent fractions with small denominators
- add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]
- compare and order unit fractions, and fractions with the same denominators
- solve problems that involve all of the above

Measurement

- measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
- measure the perimeter of simple 2-D shapes

- add and subtract amounts of money to give change, using both £ and p in practical contexts
- tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks
- estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, am/pm, morning, afternoon, noon and midnight
- know the number of seconds in a minute and the number of days in each month, year and leap year
- compare durations of events [for example, to calculate the time taken by particular events or tasks]

Geometry - properties of shapes

- draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
- recognise angles as a property of shape or a description of a turn
- identify right angles, recognise that 2 right angles make a half-turn, 3 make three-quarters of a turn and 4 a complete turn; identify whether angles are greater than or less than a right angle
- identify horizontal and vertical lines and pairs of perpendicular and parallel lines

Statistics

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

Long Term Planning Concepts See Medium Term Planning MTP for more detail.		
Autumn	**Spring**	**Summer**
Sorting and Classifying Comparison – more, fewer and equality Grouping/Unitising 1 more and 1 less Cardinality through subitising and counting Ordinality - counting Composition of number linked to addition and subtraction Shape Measure – Time: Seasons, calendar, timetable Pattern	Cardinality through subitising and counting Ordinality - counting Composition linked to addition and subtraction Teen Numbers recognition Addition and subtraction Algebra and Measure (height/length) Shape Measure – Weight/Mass Measure – Time: Seasons, calendar, timetable Pattern	Cardinality through subitising and counting Ordinality - counting Measure – length/Height Pattern Doubles Sharing Odds and evens Number facts - link to addition and subtraction Measure - Capacity Measure – Time: Seasons, calendar, timetable Measure - Money
Number and Place Value *Addition and Subtraction* *Ordinal Numbers* *Shapes and their properties* *Pattern*	Addition and Subtraction Measurement – length/height Measurement – mass/weight Measurement – capacity/volume Number and Place Value Multiplication counting in 2 and 5	Multiplication and Division – counting in 2,5 and 10 Halving and doubling Fractions Number and Place Value Measurement – time, money Position and Direction
Number and Place Value Addition and Subtraction Multiplication – doubling and halving Measurement – reading scales Multiplication – equal groups Measurement – time Times tables/counting in steps of/Multiplication facts for 10 and 5	Times tables/counting in steps of/Multiplication facts 2,3,5,10 Multiplication and division - Doubling and halving - commutativity Division Measurement - time Measurement - money Statistics Number - Number and place value Introducing fractions Geometry: Properties of shape	Addition and Subtraction Fractions

Crookham Infant School Progression in Number and Place Value							
	Cardinality		Comparing Numbers	Identifying, Representing and Estimating Numbers	Reading and Writing Numbers	Understanding Place Value	Problem Solving
	Counting	Subitising					
Year R	Know and say number names in sequence, at first to 5. Have experience of counting many irregular arrangements tagging one thing to a number word. Understand the stopping rule that the last number represents how many: The last number gives the total so far (the cardinal value). Match a number of things with a number symbol. Explore rearranging groups by combining or partitioning so that it is possible to generalise, (conservation of number).	**Pre-Mathematical Foundation Ability**: Use inborn specific "sensers" for number from the first months of life without explicit knowledge of number. Intuitively distinguish between groups of 1 and 2 (and possibly 2 and 3). Shows sensitivity to ratios of quite large numbers. (Approximate Number System, or ANS). **Very Small Number Recogniser:** Begin connecting small quantities to number words to form an explicit idea of cardinality, or "how-many-ness." Following the child's first birthday, number words "one"' and "two" are learned. Other general terms such as "more" and "less" likely to follow. Over time begin to understand that all groups labelled with the same number word have the same amount. **Maker of Small Collections** Can make a small collection (usually 1 - 2 and possibly 3) with the same number as another collection (via mental model; i.e., not necessarily by matching-for that process, see *Compare Number*). Might also be verbal but often is not. May not recognize spatial structures at first, and may count this (Nes, 2009).	Experience comparing collections of things with increasing size and complexity, e.g. start with a group that obviously has more, move to groups that are closer in size but one has more smaller things within it. Notice and talk about what they see. Explore groups of equal things and check by matching (one to one or alongside) subitising or counting. Compare numbers (actual nunerals) and explain why there is more, e.g. when told one box has 5 sweets and one has 3.	Match a number of things with a number symbol. Through the use of subitising, fives and tens frames introduce the use of the number name and symbol when the children are ready/curious.	Through the use of subitising, fives and tens frames introduce the use of the number name and symbol when the children are ready/curious.	Explore the base system using tens frames. Use these to investigate teen numbers and beyond. 'There is one finished 10 and 4 of the next ten so that is 14. Show this on a number track.	Making maths meaningful through the use of routines, games, the environment (noticing) and stories.

		Small Number Namer Names groups of 1, 2, and 3 with increasing accuracy. Most children of about 34-39 months of age can accurately name groups of 1, 2, and 3. Many children learn to recognize and name groups of 4 about 6 months later. The child is able to recognize small groups without relying on a model or matching strategy. **Perceptual Subitiser to 4** Instantly recognizes collections up to 4 briefly shown and verbally names the number items. **Perceptual Subitiser to 5** Instantly and effortlessly recognizes collections up to 5 (without counting) and verbally names the number of items. What separates this level from the previous level (perceptual subitiser to 4) is that a child recognizes and uses spatial and numeric structures from past experiences to subitise. **Conceptual Subitser to 5** Verbally labels all arrangements to about 5, shown only briefly, by seeing the parts and quickly knowing the whole. Conceptual subitising refers to the ability of children to identify a whole quantity as a result of composing smaller quantities (recognized through perceptual subitising) that make up the whole.	Compare numbers far apart and close to each other, e.g. 2 and 7, 3 and 4 by matching or counting objects. Begin to see and generalise the one more/one less relationship between sequential numbers.				

Year 1	count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens given a number, identify one more and one less	**Conceptual Subitser to 7** Verbally labels all arrangements to 6, then 7, when shown only briefly. **Conceptual Subitiser to 10** Verbally labels most briefly shown arrangements of all numbers 2 to 10. Children may know some familiar ones ("5 and 5 make 10" is common) early, but this level is reached when most all combinations of all numbers up to 10 are recognized (e.g., 7 and 2 *seen* as 9; 5 and 3 *seen* as 8; etc.). Uses structures such as tens-frames to recognize larger quantities. Children will be exposed to a changing number of objects to draw their attention and foster noticing differences. Then, they will be encouraged to make comparisons in collections of objects.	use the language of: equal to, more than, less than (fewer), most, least	identify and represent numbers using objects and pictorial representations including the number line	read and write numbers from 1 to 20 in numerals and words.		
Year 2	count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward	**Conceptual Subitiser to 20** Verbally labels structured arrangements up to 20, shown only briefly, by seeing the parts and quickly knowing the whole. Spontaneously makes use of a top-down strategy to subitising large quantities. Verbally labels arrangements up to 10, then up to 20, using groups. Children may know some familiar ones ("10 and 10 make 20" is common) early, but this level is reached when *most all* combinations of numbers from 1 to 10 are recognized (e.g., 7 and 9 is *seen* as 16).	compare and order numbers from 0 up to 100; use <, > and = signs	identify, represent and estimate numbers using different representations, including the number line	read and write numbers to at least 100 in numerals and in words	recognise the place value of each digit in a two-digit number (tens, ones)	use place value and number facts to solve problems

		Conceptual Subitiser with place value. Verbally labels structured arrangements, shown only briefly, using groups, skip counting, and place value. **Conceptual Subitiser with Place Value and Multiplicative Thinking.** Verbally labels structured arrangements, shown only briefly, using groups, multiplicative thinking, and place value. This level builds on the previous level, such that children are able to use the base-10 system to conceptually subitise larger numbers. Children are able to verbalize the quantity of 10's they see.					

Progression in Addition and Subtraction

	Number Bonds	**Mental Calculation**	**Written Methods**	**Inverse Operations, Estimating and Checking Answers**	**Problem Solving**
Year R	Within groups of objects notice different amounts – part/whole (conceptual subitising). Become familiar with seeing this using different objects moving from concrete to pictorial on a five/tens frame towards abstract (symbol) when ready. Partition a number of objects in different ways, including pairs, beginning to recall which pairs of numbers make the whole.	Explore opportunities to combine groups and partition, noticing and describing the part and whole. Use this experience to solve problems.	Explore the use of marks and pictures to represent and generalise mathematical reasoning, thinking and calculations. For example, using tally marks or circles to represent how many?	Using fives and tens frames to investigate inverse operations. For example: there are 6 counters on the tens frame. 4 more would make a complete 10 so 6 and 4 equals 10 or 10 is equal to 6 and 4. The ten is not finished yet as 4 are missing so 10 subtract 4 equals 6.	Making maths meaningful through the use of routines, games, the environment (noticing) and stories.

	Problem solve and begin to visualise which two pairs make the whole, e.g. if 3 is hidden but 2 shown this is equal to 5. Partition numbers in to more than two parts.				
Year 1	represent and use number bonds and related subtraction facts within 20	add and subtract one-digit and two-digit numbers to 20, including zero read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Written Methods)	read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs (appears also in Mental Calculation)		solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ - 9
Year 2	recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100	add and subtract numbers using concrete objects, pictorial representations, and mentally, including: * a two-digit number and ones * a two-digit number and tens * two two-digit numbers adding three one-digit numbers show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot		recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	solve problems with addition and subtraction: * using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying their increasing knowledge of mental and written methods *solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change* (copied from Measurement)

Progression in Multiplication and Division				
	Multiplication and Division Facts	**Mental Calculation**	**Written Calculation**	**Problem Solving**
Year R	Gives some, but not necessarily an equal number to each person - Child gives three blocks to one friend and one		Explore the use of marks and pictures to represent and generalise mathematical reasoning, thinking and calculations. For example, using tally	Making maths meaningful through the use of routines, games, the environment (noticing) and stories.

	block to another friend, and keeps five blocks for him or herself. Makes small groups (fewer than five). Shares by "dealing out," but usually only between two people. May not appreciate the numerical result - To share 4 blocks, gives each person a block, checks each person has one, and repeats this. Makes small equal groups (fewer than six). Deals out equally between two or more recipients, but may not understand explicitly that equal quantities are produced - Shares 6 blocks by dealing out blocks to themself and a friend one at a time. Solves small-number multiplying problems by grouping – making each group and counting all. Solves division/sharing problems with informal strategies, using concrete objects; up to 20 objects and 2-5 people. May justify results by equipartitioning using counting, arrays, or patterns - A child distributes 20 objects by giving 2 blocks to each of 5 people, then 2 more to each person until blocks are gone. A child deals out a set of 11 cards by giving one each to them self and a friend until cards are gone, but doesn't notice that one child has more than the other		marks or circles to represent how many?	
Year 1	*count in multiples of twos, fives and tens* (copied from Number and Place Value)			solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher

Year 2	*count in steps of 2, 3, and 5 from 0, and in tens from any number, forward or backward* (copied from Number and Place Value) recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot	calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) and equals (=) signs	solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts

Progression in Fractions

	Counting in Fractional Steps	**Recognising Fractions**	**Equivalence (Fractions, Decimals and Percentages)**
Year R		**Can equipartition a whole shape, such as a circle or rectangle - Children can draw lines on paper "cakes" to share equally with a friend.** **-Children can split food equally with a friend. Recognizes "halves" at least in continuous (e.g., area) representations, especially in the context of fair shares. Recognition of the need for ½ when sharing an odd number of objects. Intuitively and visually combines regions that are a part of a whole, showing initial foundations for addition -Recognizes what is and is not "half" when sharing a sandwich with their sister** Sharing an amount between two or more. **When subitising see a whole and begin to see parts of a number (move from perceptual to conceptual subitising). Notice and make equal groups within a whole.** Using the part whole model investigate making equal and unequal parts.	**Notice and make equal groups within a whole - unitising** Using the part whole model investigate making equal and unequal parts.
Year 1		recognise, find and name a half as one of two equal parts of an object, shape or quantity	
Year 2	*Pupils should count in fractions up to 10, starting from any number and using the1/2 and 2/4 equivalence on the number line (Non Statutory Guidance)*	recognise, find, name and write fractions $^{1}/_{3}$, $^{1}/_{4}$, $^{2}/_{4}$ and $^{3}/_{4}$ of a length, shape, set of objects or quantity	write simple fractions e.g. $^{1}/_{2}$ of 6 = 3 and recognise the equivalence of $^{2}/_{4}$ and $^{1}/_{2}$.

Progression in Measurement				
	Comparing and Estimating	**Measuring and Calculating**	**Telling the Time**	**Converting**
Year R	Notice what is around them and their attributes e.g. that trees are tall or long. Use gestures and words to compare amounts of continuous quantities (length, capacity, weight) with adults supporting the vocabulary of what is explored e.g. long, tall, heavy, full rather than just 'big'. Use direct comparison by placing side by side (length) or by filling containers pouring from one to another (capacity) or by comparing the pull down (mass). Explore a variety of objects in comparison so that generalisations can be formed and misconceptions addressed (e.g. big does not equal heavy). Begin to estimate and predict, e.g. which box will Teddy fit in? Compare indirectly, for example ordering three things, using one object to decide on another, making a prediction about whether something will fit through a door by visualising.	Make direct comparison and begin to use comparative language to say that something is taller than, heavier or lighter than, longer/shorter than. When comparing begin to use a variety of tools such as a spring or simple balance scale. Begin to use units of different sizes in a practical context, e.g. a variety of jugs and containers. Explore choosing the right unit to solve a problem, e.g. will all the balls fit in this bucket? Is there enough juice in the jug for two cups? Begin to use standard units to measure and compare in practical contexts, e.g. metre sticks, scales, timers without fully understanding how they work.	Develop a sense of number, space, time through things that are meaningful to them, e.g. their age, birthday month. Sequence activities and things that are important to them to gain a sense of time, alongside developing early counting. Develop the vocabulary of time through songs, thymes and experiences, fostering an interest in watches, clocks and the sequence of time e.g. days of the week. Experience specific time spans to develop a sense of time, e.g. number of sleeps until… Explore timers in play and experience how many activities may be completed in a time period e.g. one minute.	
Year 1	compare, describe and solve practical problems for: * lengths and heights [e.g. long/short, longer/shorter, tall/short, double/half] * mass/weight [e.g. heavy/light, heavier than, lighter than] * capacity and volume [e.g. full/empty, more than, less than, half, half full, quarter] time [e.g. quicker, slower, earlier, later] sequence events in chronological order using language [e.g. before and after,	measure and begin to record the following: * **lengths and heights** * **mass/weight** * **capacity and volume** * **time** (hours, minutes, seconds) recognise and know the value of different denominations of **coins and notes**	tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. recognise and use language relating to dates, including days of the week, weeks, months and years	

	next, first, today, yesterday, tomorrow, morning, afternoon and evening]			
Year 2	compare and order lengths, mass, volume/capacity and record the results using >, < and = compare and sequence intervals of time	choose and use appropriate standard units to estimate and measure **length/height** in any direction (m/cm); **mass** (kg/g); **temperature** (°C); **capacity** (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels recognise and use symbols for pounds **(£) and pence (p)**; combine amounts to make a particular value find different combinations of coins that equal the same amounts of money **solve simple problems** in a practical context involving addition and subtraction of money of the same unit, including giving change	tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times. know the number of minutes in an hour and the number of hours in a day. (appears also in Converting)	know the number of minutes in an hour and the number of hours in a day. (appears also in Telling the Time)

Progression in Geometry (Properties of Shapes)		
	Identifying Shapes and their Properties	**Comparing and Classifying**
Year R	Develop shape awareness through construction: Through play explore shapes, the attributes of particular shapes and select shapes to fulfil a particular need. Show awareness of the properties of shape through exploring an increasing range of shapes when selecting them to use in play. Use informal language to describe the properties of shape that make them fit for the chosen purpose. Begin to see and describe shapes within shapes. Begin to predict what might happen when shapes are changed, e.g. folded in half, rotated, reflected.	Identify similarities between shapes when using them to represent objects in their environment. Notice the properties of the objects represented so that appropriate shapes are chosen. Begin to notice and comment on shapes within shapes and make comparison, e.g. in size.
Year 1	recognise and name common 2-D and 3-D shapes, including: * 2-D shapes [e.g. rectangles (including squares), circles and triangles] * 3-D shapes [e.g. cuboids (including cubes), pyramids and spheres].	
Year 2	identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces	compare and sort common 2-D and 3-D shapes and everyday objects

	identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]	
Progression in Geometry (Position and Direction)		
	Position, Direction and Movement	**Pattern**
Year R	Through play be given opportunities to explore and use the language of position and direction. Position: in, on, under. Direction: up, down, across. Explore and use language appropriate to viewpoint: in front of, behind, forwards, backwards and later left and right. Explore representing spatial relationships in small world play, creative play and model building. Describe the representations created from different viewpoints, e.g. when making a pirate treasure map look down or rotate.	Develop spatial awareness and experience different viewpoints: Through play experience opportunities to move themselves and objects around so that they learn to visualise what happens when they or objects rotate, reflect, insert, flip, and fit together. Represent objects in pictures and patterns created in their play. Continue, copy and then make their own AB pattern. Spot an error in an AB pattern and then learn to spot the repeating unit in a pattern. Continue an ABC pattern and then continue patterns that end in the middle. Make their own ABB and ABBC patterns and spot errors in an ABB pattern. As their gain experience in continuing, copying, creating their own patterns and spotting errors begin to represent the patterns with symbols that represent the unit structure. Generalise patterns to another structure, e.g. repeat a shape pattern with natural resources. Create patterns that repeat around a circle or have a set number of spaces. Recognise and describe patterns in the environment around us.
Year 1	describe position, direction and movement, including half, quarter and three-quarter turns.	
Year 2	use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)	order and arrange combinations of mathematical objects in patterns and sequences

Progression in Statistics	
	Statistics
Year R	
Year 1	
Year 2	interpret and construct simple pictograms, tally charts, block diagrams and simple tables ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity ask and answer questions about totalling and comparing categorical data

Progression in Algebra		
	Equations	**Sequences**

Year R	Using cuisinare rods and bar models in meaningful contexts such as comparing heights of two objects.	Detects and uses patterning implicitly and intuitively, such as in movement activities or common nursery rhymes that repeat words and action. May be attentive to repeating patterns without recognizing them explicitly or accurately, often attending to individual attributes such as colour. Recognizes a simple sequential pattern, usually ABABAB, as a pattern, even if doesn't yet name or describe it Recognizes, describes, and builds repeating ABAB patterns. These involve the following, which many children learn in this order, although this can vary by the task*. • Fixes AB: Fills in the missing element of an ABAB pattern. • Duplicates AB: Duplicates ABABAB pattern (at first may have to work close to the model pattern, but eventually can build the same pattern away from the model pattern or when the model is out of sight). • Extends AB: Extends AB patterns to add multiple units to the end of the pattern. This is easier for children if the pattern ends with a complete unit, but they eventually learn to extend those that end with a partial unit. -For example, patterns represented by two attributes of change (shape and colour) are easier than those represented by just one (e.g., orientation).
Year 1	*solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and* ***missing number problems*** *such as* *7 = □ - 9* (copied from Addition and Subtraction) *represent and use number bonds and related subtraction facts within 20* (copied from Addition and Subtraction)	*sequence events in chronological order using language such as: before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening* (copied from Measurement)
Year 2	*recognise and use the inverse relationship between addition and subtraction and use this to check calculations and* ***missing number*** *problems.* (copied from Addition and Subtraction) *recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100* (copied from Addition and Subtraction)	*compare and sequence intervals of time* (copied from Measurement) *order and arrange combinations of mathematical objects in patterns* (copied from Geometry: position and direction)

Progression in Subitising with Exemplars and activity suggestions.
https://www.learningtrajectories.org/index.php/math/learning-trajectories/subitising

Subitiing Step	Descriptor	Example Activities
1. Pre-Mathematical Foundation Ability:	Use inborn specific "sensers" for number from the first months of life without explicit knowledge of number. Intuitively distinguish between groups of 1 and 2 (and possibly 2 and 3).	• Shown many groups of three, a child "habituates" to them (i.e., becomes uninterested, relaxed) but immediately shows interest when then shown a group of two.

	Shows sensitivity to ratios of quite large numbers. (Approximate Number System, or ANS).	• An infant visually tracks the path of a moving object. • A toddler takes enjoyment when a large number of toys are provided at once, but may need the number to be reduced to avoid overstimulation. These suggestions promote everyday experiences with…almost everything! That is, children are sensitive to quantity, and (perceptually obvious) difference in quantities in the first year of life. Providing opportunities to observe and manipulate quantities and change in quantities builds on their natural sensitivities and interest. Providing language enhances these experiences. https://www.learningtrajectories.org/math-activities/number-talk https://www.learningtrajectories.org/math-activities/number-peekaboo https://www.learningtrajectories.org/math-activities/numbers-at-home https://www.learningtrajectories.org/math-activities/which-has-more-stemie
2. Very Small Number Recogniser:	Begin connecting small quantities to number words to form an explicit idea of cardinality, or "how-many-ness." Following the child's first birthday, number words "one"' and "two" are learned. Other general terms such as "more" and "less" likely to follow. Over time begin to understand that all groups labelled with the same number word have the same amount.	• May be able to recognize "one" or "two" when asked, but may not yet verbally name these quantities. • At about 18 to 22 months, toddlers may use "two" to mean "more than one." Toddlers can identify whether collections are the "same" number or which is "more" visually. By 24 months of age, many toddlers have learned their first number word (typically "two"). Toddlers understand "first" and "last." • At about 22 to 28 months, children use "two" spontaneously and reliably to identify pairs of items. But between 24-36 months, they may overgeneralize "two" and use it to mean any number more than one and then, at about 37-

		39 months, they return to a more exact use of "two." • At 34-39 months, children finally achieve 51-89% proficiency with "3." At 40-43 months (6 months later) still operating at 51-89% and >90% with 4. Experience with single objects and especially two ("one in each hand!") are noticed and labeled by adults. https://www.learningtrajectories.org/math-activities/naming-numbers https://www.learningtrajectories.org/math-activities/numbers-on-me-very-small-number-recognizer https://www.learningtrajectories.org/math-activities/which-has-more-stemie
3. Maker of Small Collections	Can make a small collection (usually 1 - 2 and possibly 3) with the same number as another collection (via mental model; i.e., not necessarily by matching-for that process, see *Compare Number*). Might also be verbal but often is not. May not recognize spatial structures at first, and may count this (Nes, 2009).	• When shown a collection of 3, a child makes another collection of 3 in the same arrangement. • When shown one snack and asked to give one to a friend, a child hands over one snack. • A child relies on use of a matching strategy or other model to make a small collection. These experiences are informal opportunities for children to make a set that "looks like" it has the same number as another (1 or 2, possibly 3). For example, "I have two Cheerios. You get two!" https://www.learningtrajectories.org/math-activities/concentration https://www.learningtrajectories.org/math-activities/get-the-number https://www.learningtrajectories.org/math-activities/make-groups https://www.learningtrajectories.org/math-activities/find-my-home-stemie
4. Small Number Namer	Names groups of 1, 2, and 3 with increasing accuracy. Most children of about 34-39 months of age can accurately name	• Three dogs walk by, child says, "Three doggies!"

	groups of 1, 2, and 3. Many children learn to recognize and name groups of 4 about 6 months later. The child is able to recognize small groups without relying on a model or matching strategy.	• Shown a pair of shoes, a child says, "Two shoes." • When asked, "How many blocks do you have?" a child shows a caregiver one block in each hand and says "Two. Everyday experiences discussing "one," "two," and even "three" objects (or sounds or actions) help children build the basic idea of number. https://www.learningtrajectories.org/math-activities/concentration https://www.learningtrajectories.org/math-activities/i-see-numbers https://www.learningtrajectories.org/math-activities/subitize-planets-small-collection-namer https://www.learningtrajectories.org/math-activities/board-games-small-numbers https://www.learningtrajectories.org/math-activities/is-it https://www.learningtrajectories.org/math-activities/number-me-small-collection-namer https://www.learningtrajectories.org/math-activities/tricky-two https://www.learningtrajectories.org/math-activities/find-my-home-stemie
5. Perceptual Subitiser to 4	Instantly recognizes collections up to 4 briefly shown and verbally names the number items.	When three dots are arranged in a triangle, a child sees this arrangement, process and organize what they know about it based on previous experience, and recall that the numerical label of "three" is appropriate for naming this set. With practice, a child's processing becomes more efficient, and they can effortlessly label "three" when dots are in a triangular arrangement. When shown 4 objects briefly, says "four." Activities throughout the day naming the number in sets of 1 to 4 and game-like opportunities to name the number in sets only seen for 2 seconds or less help develop this fundamental numeracy concept. Simple,

		high-contrast items (e.g., black dots on white paper plates) focus children's attention on the number in the set. https://www.learningtrajectories.org/math-activities/subitize-planets-perceptual-subitizer-to-4 https://www.learningtrajectories.org/math-activities/snapshots-to-4 https://www.learningtrajectories.org/math-activities/foxy-four-tricky-two
6. Perceptual Subitiser to 5	Instantly and effortlessly recognizes collections up to 5 (without counting) and verbally names the number of items. What separates this level from the previous level (perceptual subitiser to 4) is that a child recognizes and uses spatial and numeric structures from past experiences to subitise.	A child is shown the five side of a game die (4 dots arranged as a square, with one dot in the middle). When asked "How many?" the child answers "Five!" Activities throughout the day naming the number in sets of 1 to 5 and game-like opportunities to name the number in sets only seen for 2 seconds or less help develop this fundamental numeracy concept. Simple, high-contrast items (e.g., black dots on white paper plates) focus children's attention on the number in the set. https://www.learningtrajectories.org/math-activities/subitize-planets-perceptual-subitizer-to-5 https://www.learningtrajectories.org/math-activities/hearing-numbers-to-4 https://www.learningtrajectories.org/math-activities/fantastic-five-tricky-two https://www.learningtrajectories.org/math-activities/snapshots-perceptual-subitizer-to-5
7. Conceptual Subitser to 5	Verbally labels all arrangements to about 5, shown only briefly, by seeing the parts and quickly knowing the whole. Conceptual subitising refers to the ability of children to identify a whole quantity as a result of composing smaller quantities (recognized through perceptual subitising) that make up the whole.	• A child rolls a pair of dice and knows there are 5 dots because they see a 2 and a 3. • The child says, "I rolled a five; I saw 3 and 2 and so it's five!" Activities throughout the day naming the number in sets of 1 to 5 and game-like opportunities to name the number in sets in different arrangements (such as a group of 2 next to a group of 3) only seen for 2 seconds or less help develop children's ability to quickly see a

		whole number by perceiving two parts. Two different colors may help children initially distinguish the two parts, but they may limit children's creativity in how they partition the objects, engendering rich discussions. So simple identical objects are often the best choice https://www.learningtrajectories.org/math-activities/subitize-planets-conceptual-subitizer-to-5 https://www.learningtrajectories.org/math-activities/snapshots-conceptual-subitizer-to-5 https://www.learningtrajectories.org/math-activities/hearing-numbers-to-4
8. Conceptual Subitser to 7	Verbally labels all arrangements to 6, then 7, when shown only briefly.	• A child rolls a pair of dice and knows there are 7 dots because they see a 2 and a 5. • The child says, "I rolled seven; I saw 5 and 2 and so it's seven!" Activities throughout the day naming the number in sets up to 7 and especially short, frequent, game-like opportunities to name the number in sets in different arrangements (such as a group of 2 next to a group of 3) only seen for 2 seconds or less help develop children's ability to quickly see a whole number by perceiving two parts. Two different colors may help children initially distinguish the two parts, but they may limit children's creativity in how they partition the objects, engendering rich discussions. So simple identical objects are often the best choice. https://www.learningtrajectories.org/math-activities/snapshots-conceptual-subitizer-to-7 https://www.learningtrajectories.org/math-activities/subitising-slapjack
9. Conceptual Subitiser to 10	Verbally labels most briefly shown arrangements of all numbers 2 to 10. Children may know some familiar ones ("5 and 5 make 10" is common) early, but this level is reached when most all combinations of all numbers up to 10 are recognized (e.g., 7 and 2 *seen* as 9; 5 and 3 *seen* as 8; etc.).	• A child explains, "In my mind, I made a group of 6 and then a group of 3 more, so that's 9." • Child says, "You can make 10 with 5 and 5." or "I saw 6 and 4, which is 10."

	Uses structures such as tens-frames to recognize larger quantities.	Short, frequent, game-like opportunities to name the number in sets up to 10 in different arrangements (such as a group of 6 next to a group of 3) only seen for 2 seconds or less help develop children's ability to quickly see a whole number by perceiving two parts. With larger numbers, structured arrangements such as five-and-tens frames are helpful. https://www.learningtrajectories.org/math-activities/subitize-planets-conceptual-subitizer-to-10 https://www.learningtrajectories.org/math-activities/snapshots-to-10 https://www.learningtrajectories.org/math-activities/the-subitize-song
10. Conceptual Subitiser to 20	Verbally labels structured arrangements up to 20, shown only briefly, by seeing the parts and quickly knowing the whole. Spontaneously makes use of a top-down strategy to subitising large quantities. Verbally labels arrangements up to 10, then up to 20, using groups. Children may know some familiar ones ("10 and 10 make 20" is common) early, but this level is reached when *most* *all* combinations of numbers from 1 to 10 are recognized (e.g., 7 and 9 is *seen* as 16).	• "I saw three fives, so ten and five...15" • When shown two rods of 10 units, a child says "That's 20." • A child instantly recognizes "12" as a full tens-frame and 2 additional units filled, but has more difficulty with two unfilled tens-frames, such as an 8 and a 7. • A child "sees" 7 and 2 as 9. Short, frequent, game-like opportunities to name the number in sets up to 20 in different arrangements (such as a group of 6 next to a group of 3) only seen for 2 seconds or less help develop children's ability to quickly see a whole number by perceiving two parts. With larger numbers, structured arrangements such as five-and-tens frames are helpful. https://www.learningtrajectories.org/math-activities/subitize-dots-to-20 https://www.learningtrajectories.org/math-activities/concentration-match-sums https://www.learningtrajectories.org/math-activities/subitize-planets-conceptual-subitizer-to-20
11. Conceptual Subitiser with place value	Verbally labels structured arrangements, shown only briefly, using groups, skip counting, and place value.	• A child figures 'how many' with this thinking - "I saw groups of tens and twos, so 10, 20, 30, 40, 42, 44, 46...46!"

		• A child decomposes by saying, "I have a 10-rod, so it has 10 units of one." Game-like activities ask children to name the total number in two sets, each of which has some 10s and some 1s (best in fives and tens frames). https://www.learningtrajectories.org/math-activities/snapshots-to-50 https://www.learningtrajectories.org/math-activities/subitize-planets-conceptual-subitizer-place-value https://www.learningtrajectories.org/math-activities/black-jack
12. Conceptual Subitizer with Place Value and Multiplicative Thinking.	Verbally labels structured arrangements, shown only briefly, using groups, multiplicative thinking, and place value. This level builds on the previous level, such that children are able to use the base-10 system to conceptually subitise larger numbers. Children are able to verbalize the quantity of 10's they see.	Game-like activities ask children to name the total number in two sets, at least one of which has multiple copies of 10s and 1s in clear equal groups (e.g., 3 groups of 3 ones). • A child sees a group of 62 dots and says "I saw groups of tens and threes, so I thought, 5 tens is 50 and 4 threes is 12, so 62 in all." • Shown 4 dice, 3 on the 5 sides and 1 on the 2 sides, a child says "That was 15 and 2... 17!" Activity Ideas: https://www.learningtrajectories.org/math-activities/subitize-planets-conceptual-subitizer-place-value https://www.learningtrajectories.org/math-activities/snapshots-conceptual-subitizer-with-place-value-and-multiplicative-thinking

NUMBER SENSE MASTERY AT CROOKHAM INFANT SCHOOL

We want all children to develop Maths Mastery.

This means developing FLUENCY in number, pattern, relationships (progression in all the skills displayed here) which is then applied to problem solve across all areas of Maths.

Subitising

Key Concepts: How many? Comparison

- Perceptual – seeing whole
- Conceptual – seeing whole as part/s
- Understanding a group has a label
- Whole is made up of parts
- Conservation of parts are equal to the whole

Counting

Key Concepts: How many? Cardinality Number Order (Ordinality)

- Finding out 'how many' when amount can't be seen as a whole (cardinality)
- Understanding number order (counting in equal amounts 1s, 2s, etc)
- Pattern of digits (repeating numerical patterns due to place value)
- Number used for position (first, second…)

Part/Whole

Key Concepts: A group of items (the whole is made up of parts

- Parts can be equal and unequal
- Parts can be the whole itself or many parts (not just two)
- Number bonds typically refer to two parts and area a key foundation for addition and subtraction

Unitising

Key Concepts: The creation of a finished group of a pre-determined size

- **Equality**
- **Pattern**
- **Place Value**
- **Multiplication**
- **Division**
- **Bases**

Reading and Writing Digits

Key Concepts: Being able to associate the name and the symbol with the concept image of a number

- Number names (in each language spoken)
- Number names in order (forward, backwards and skip counting)
- Formation
- Orientation
- Connection with concept images
- Connection with place value

MASTERY ASPECTS to look for in young children:

Children's talk - serve and return, self-regulation and meta cognition, children's agency and self-belief, strong learning habits, the characteristics of effective learning, sustained shared thinking, child-led play and activities (Chilvers D 2021)