A Guide to Mathematics at Carlinghow Academy

This document outlines the expectations of how we teach Mathematics at Carlinghow. It includes the key strategies we use and what Mathematics looks like in the school.

This guide includes information about the following:

- Intent, Implementation and Impact
- Using White Rose Maths Schemes of Learning
- Flashback 4
- Using Arbor
- Unit Front Covers
- Assessment
- Coloured Boxes
- Concrete, Pictorial and Abstract
- 'Keep Up not Catch up' (Same Day Intervention)
- Resources
- Differentiation
- NRich
- Working Walls
- Times Table Rockstars
- Think Pink/ Next Steps
- Presentation/Calculation Policies
- Book Scrutiny Feedback
- Making Maths Exciting
- Cross-Curricular Maths
- Three Before Me
- Useful Resources

Intent

Carlinghow Academy's curriculum is driven by the academy's vision that all children 'can and will succeed'.
We provide an ambitious knowledge engaged curriculum that offers exciting and meaningful learning opportunities that motivate and inspire.
The curriculum is underpinned by the National Curriculum and ensures that, at each stage of their learning journey, each child acquires a rich bank of knowledge and skills. This knowledge and these skills in all curriculum subjects are learned, practised, retrieved and remembered at every stage of their journey through school.
Our curriculum is not narrowed, we have designed an ambitious curriculum based on the knowledge of our learners that includes a high proportion of disadvantaged and SEND pupils to ensure that they are equipped with the knowledge and cultural capital they need to succeed in life. Where appropriate a bespoke and highly personalised curriculum offer is made to individual pupils.
Our subject-specific approach is designed so that subject specific skills are taught within an exciting enquiry question or 'big question' each half term and enables our children to make meaningful links and become passionate about their own learning and wellbeing. Hooks, enrichment activities and extra-curricular opportunities supplement each 'big question' to enable our children to make connections in their learning and acquire a deep understanding. We ensure that the links we make are real, not contrived and choose areas where genuine connections between subjects occur naturally. We ensure that the connections make sense to the children.
We are determined that every child, will have a lifelong love of reading, and will be able to comprehend and read fluently by the end of Year 6. Our curriculum is led by the high quality and diverse texts that we choose to support learning.
We have created an environment where children are motivated to learn together in a respectful, safe and trusted learning environment where individual success are celebrated.
It is our intent that when our pupils leave school, they will articulate tier 3 vocabulary of the mathematics curriculum. They will know and remember key learning of mathematics from their primary years.

Implementation

The curriculum is a knowledge engaged curriculum based on good quality resources.
This Maths guide explains how the Mathematics curriculum is implemented at Carlinghow Academy. The school has adapted the curriculum to help reflect and represent the diversity of our pupils. Creativity and teacher expertise, underpinned by high quality research informed CPD, is woven into the curriculum with specialist teachers and outside agencies working with pupils and teachers, sharing good practice and ensuring that learners learn from the best.

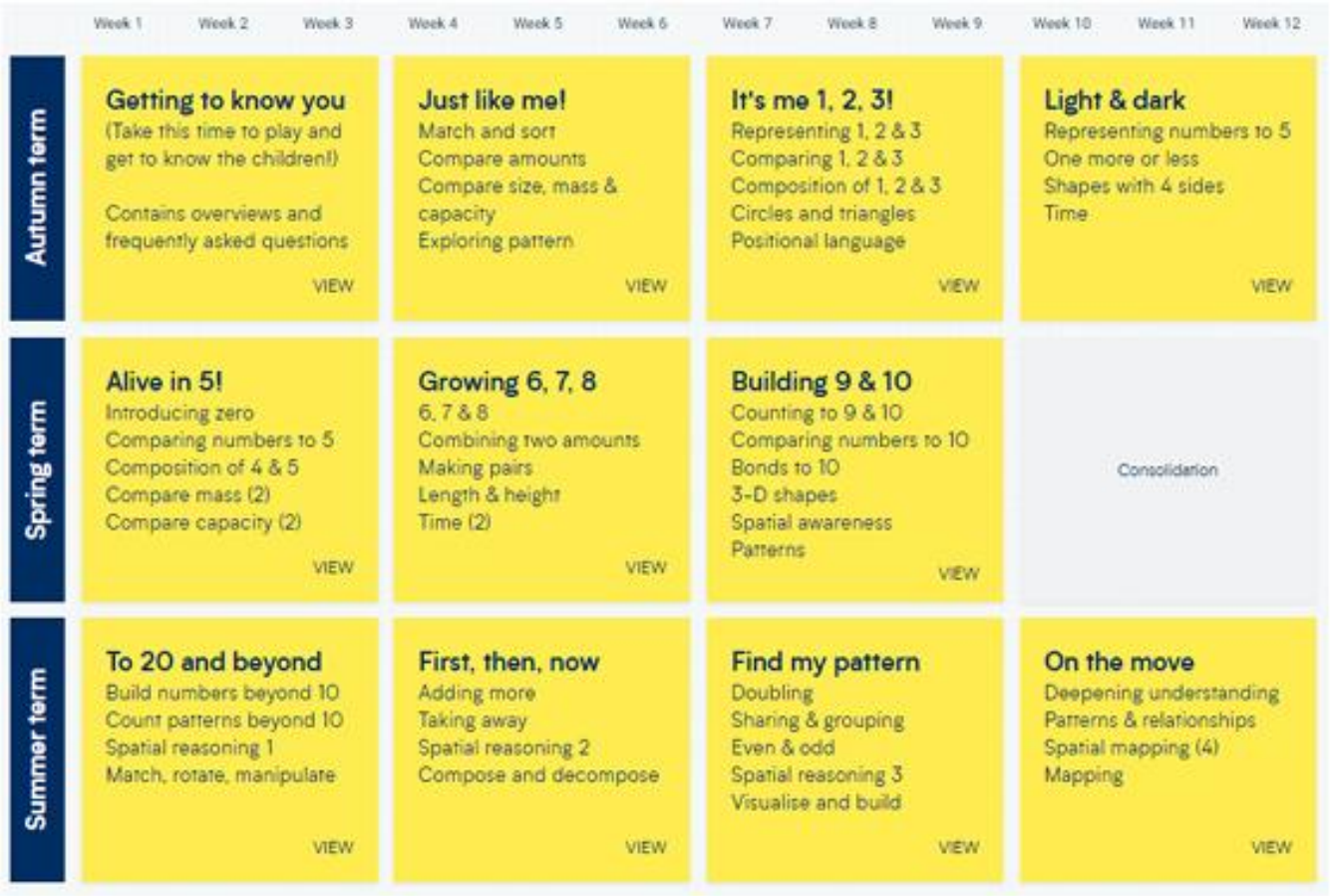
Impact

The impact of providing such an ambitious curriculum driven by the academy's vision and values and taught by skilled teachers ensures that the children of Carlinghow Academy leave prepared for the next stage of their education and able to succeed in life. Knowledge, understanding and skills are secured and embedded so that children attain highly. They take pride in all that they do, always striving to do their best. They demonstrate emotional resilience and the ability to persevere when they encounter challenge. They develop a sense of selfawareness and become confident in their own abilities. They are kind, respectful and honest, demonstrate inclusive attitudes and have a sense of their role in our wider society. They have strong communication skills, both written and verbal, and listen respectfully and with tolerance to the views of others. They take risks and are emotionally resilient recognising that

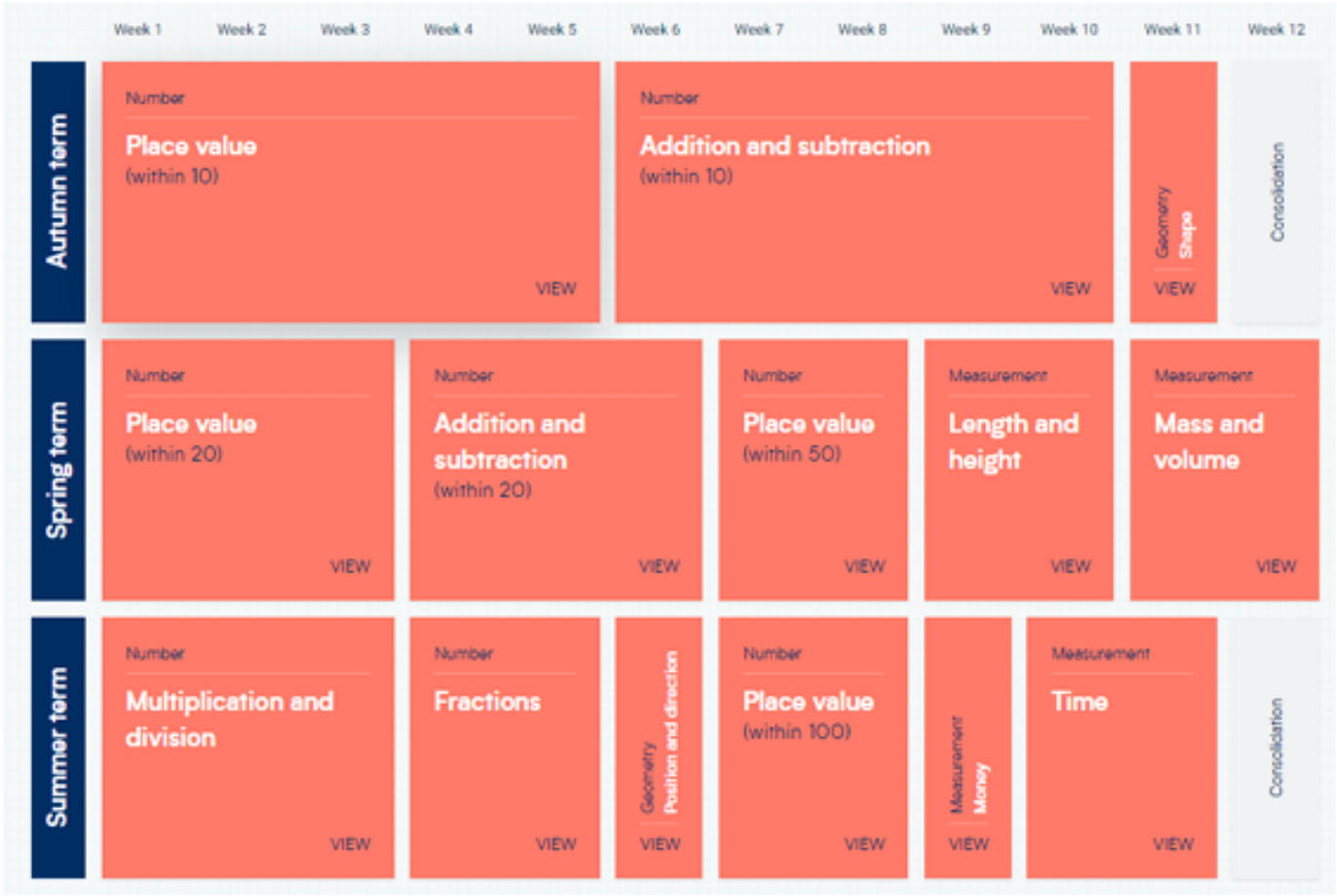
we make mistakes and learn from them. They dream big and have high aspirations fostered by the belief that with determination and hard work anything is possible.

White Rose Schemes of Learning Overview

Reception



Year 1


Week 1
Week 2
Week 3
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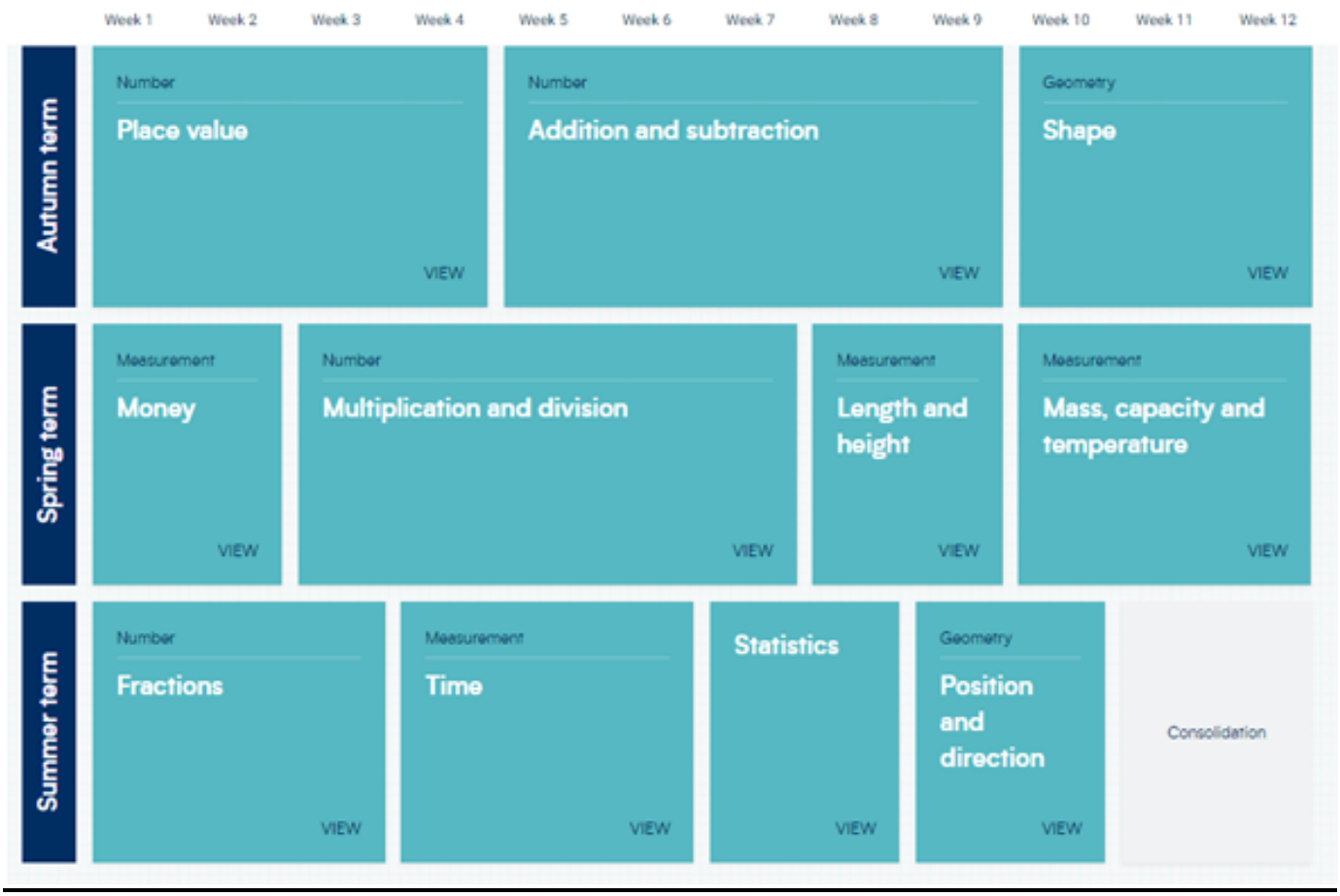
Week 8
Week 9
Week 10
Week 11
Week 12
Autumn term
Number
Place value
(within 10)
VIEW
Number
Addition and subtraction
(within 10)
VIEW
Geometry
Shape
VIEW
Consolidation
Spring term
Number
Place value
(within 20)
VIEW
Number
Addition and subtraction
(within 20)
VIEW
Number
Place value
(within 50)
VIEW
Measurement
Length and height
VIEW
Measurement
Mass and volume
VIEW
Summer term
Number
Multiplication and division
VIEW
Number
Fractions
VIEW
Geometry
Position and direction
VIEW
Number
Place value
(within 100)
VIEW
Measurement
Money
VIEW
Measurement
Time
VIEW
Consolidation

Year 2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Week 12
Autumn term
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Number
Addition and subtraction
VIEW
Geometry
Shape
VIEW
Spring term
Measurement
Money
VIEW
Number
Multiplication and division
VIEW
Measurement
Length and height
VIEW
Measurement
Mass, capacity and temperature
VIEW
Summer term
Number
Fractions
VIEW
Measurement
Time
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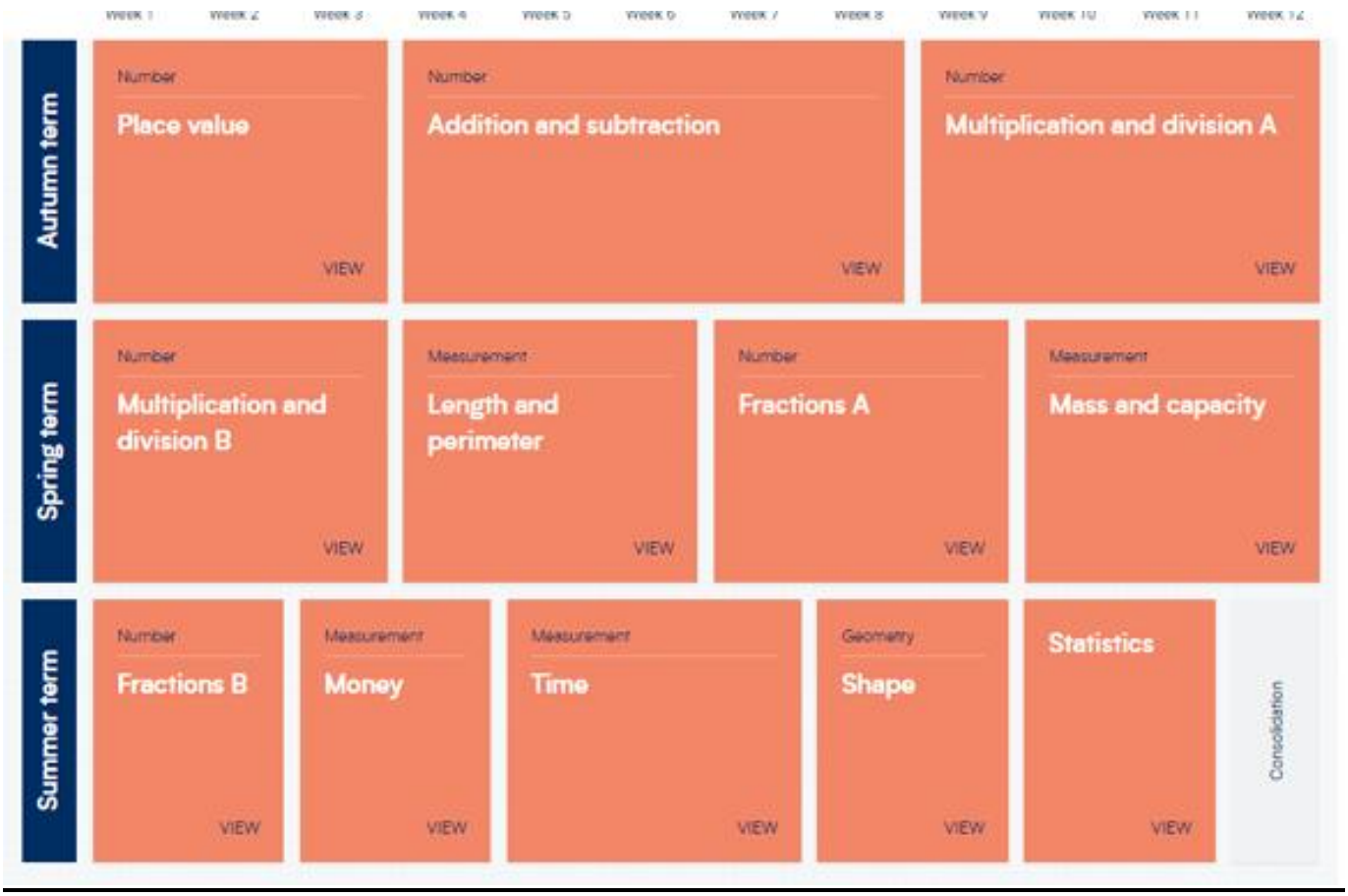
Statistics
VIEW
Geometry
Position and direction
VIEW
Consolidation

Year 3


Autumn term
Number
Place value
VIEW
Number
Addition and subtraction
VIEW
Number
Multiplication and division A
VIEW
Spring term
Number
Multiplication and division B
VIEW
Measurement
Length and perimeter
VIEW
Number
Fractions A
VIEW
Measurement
Mass and capacity
VIEW
Summer term
Number
Fractions B
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Measurement
Money
VIEW
Measurement
Time
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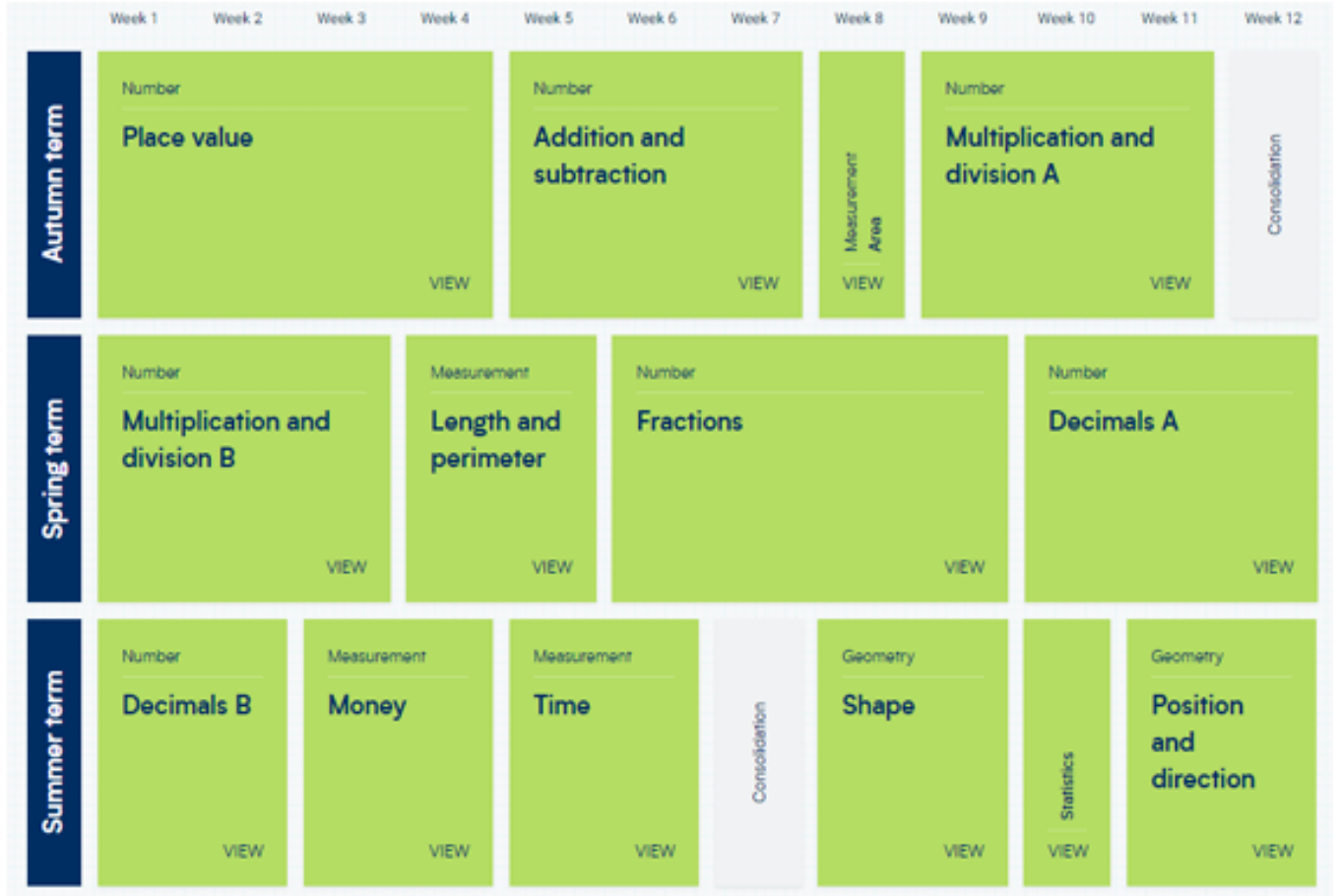
Geometry
Shape
VIEW
Statistics
VIEW
Consolidation

Year 4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Number
Addition and subtraction
VIEW
Measurement
Area
VIEW
Number
Multiplication and division A
VIEW
Consolidation
Spring term
Number
Multiplication and division B
VIEW
Measurement
Length and perimeter
VIEW
Number
Fractions
VIEW
Number
Decimals A
VIEW
Summer term
Number
Decimals B
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Measurement
Money
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Measurement
Time
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Consolidation
Geometry
Shape
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Statistics
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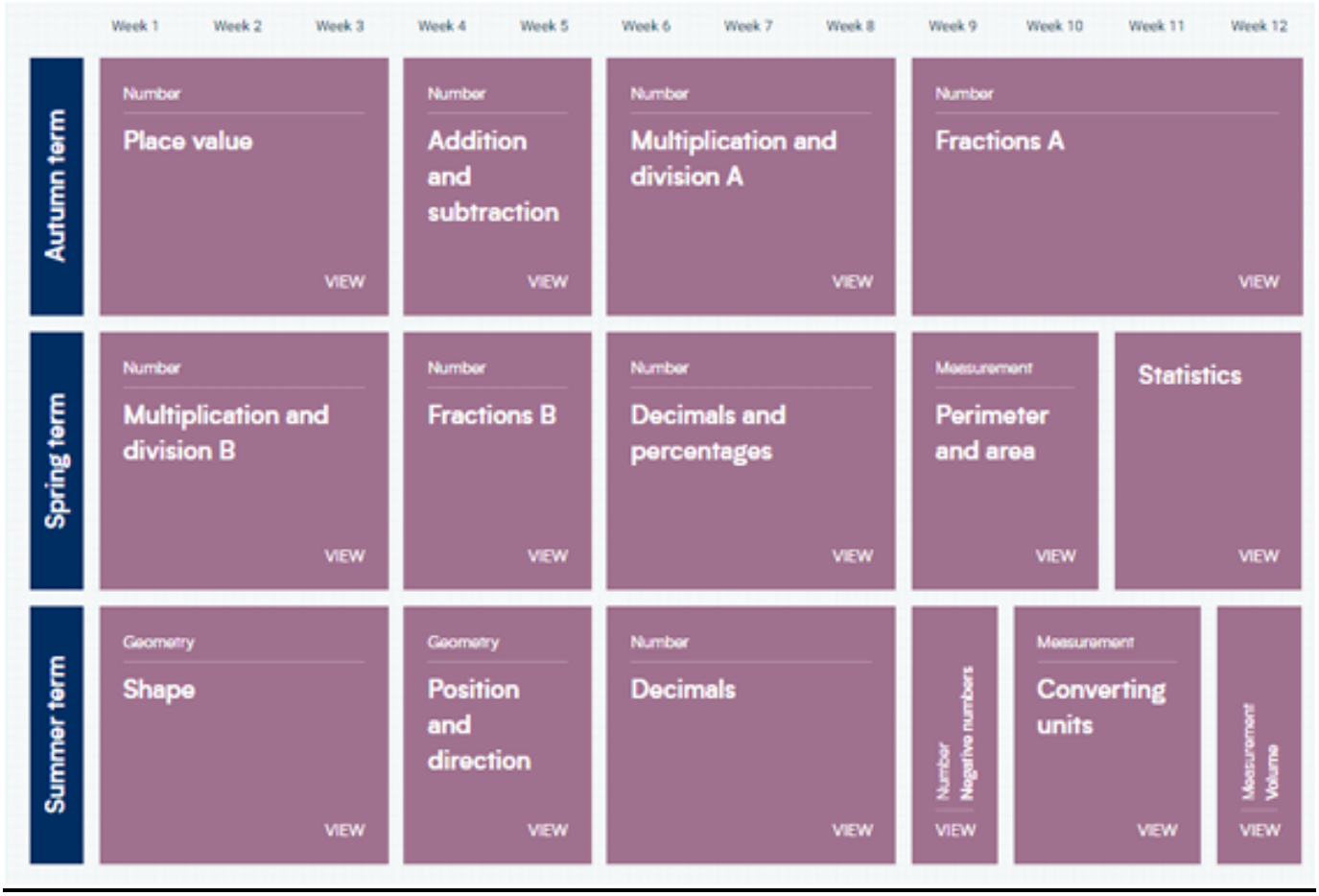
Geometry
Position and direction
VIEW

Year 5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Week 12
Autumn term
Number
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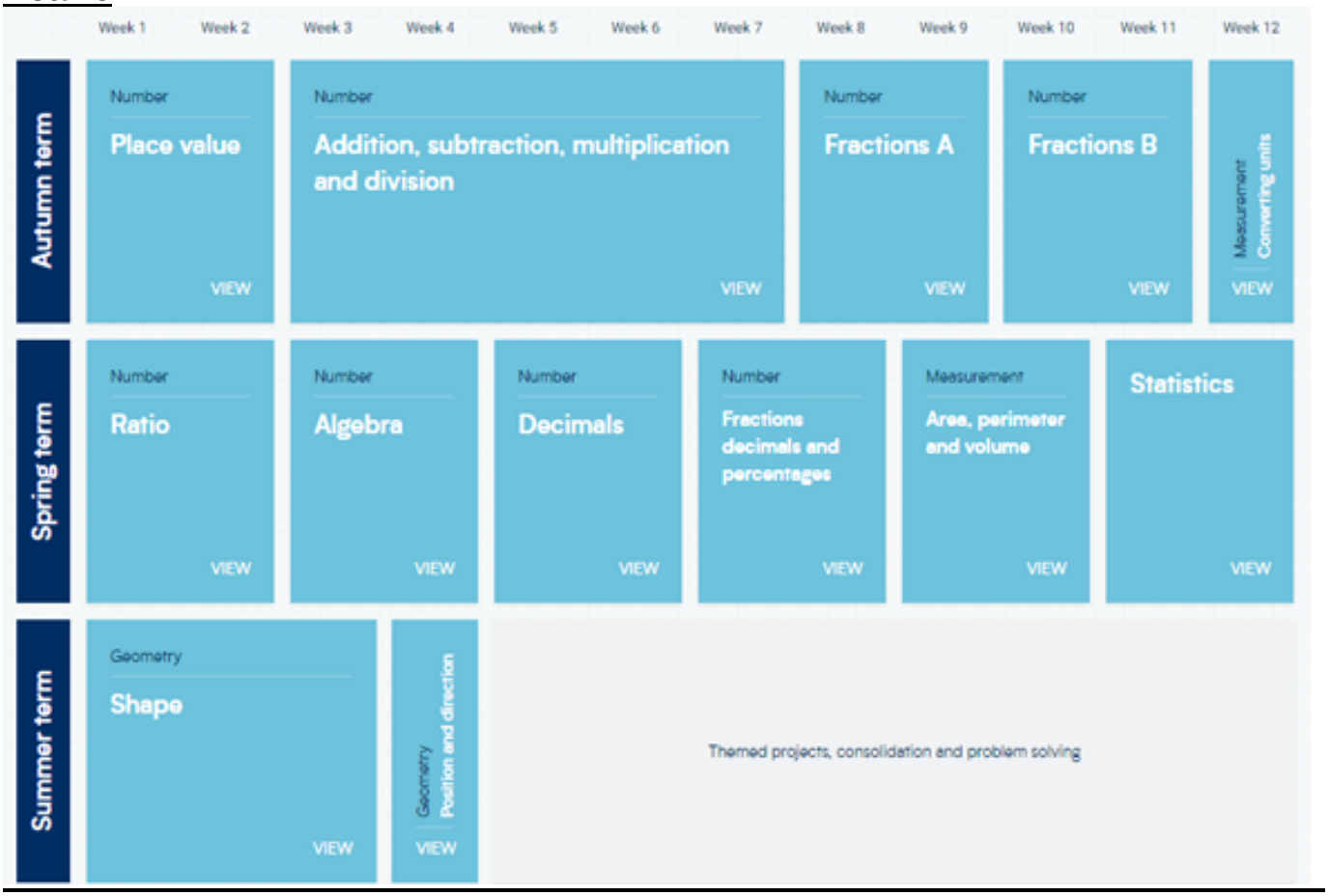
Number
Addition and subtraction
VIEW
Number
Multiplication and division A
VIEW
Number
Fractions A
VIEW
Spring term
Number
Multiplication and division B
VIEW
Number
Fractions B
VIEW
Number
Decimals and percentages
VIEW
Measurement
Perimeter and area
VIEW
Statistics
VIEW
Summer term
Geometry
Shape
VIEW
Geometry
Position and direction
VIEW
Number
Decimals
VIEW
Number
Negative numbers
VIEW
Measurement
Converting units
VIEW
Measurement
Volume
VIEW

Year 6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Week 9
Week 10
Week 11
Week 12
Autumn term
Number
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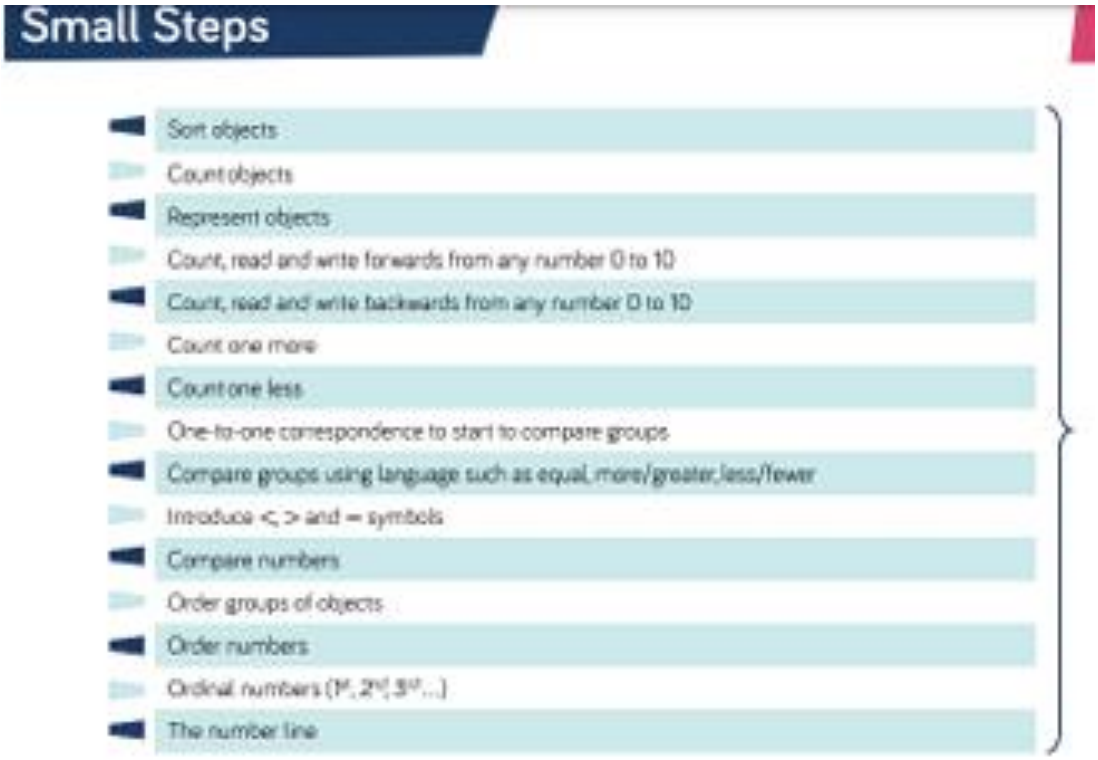
VIEW
Number
Addition, subtraction, multiplication and division
VIEW
Number
Fractions A
VIEW
Number
Fractions B
VIEW
Measurement
Converting units
VIEW
Spring term
Number
Ratio
VIEW
Number
Algebra
VIEW
Number
Decimals
VIEW
Number
Fractions decimals and percentages
VIEW
Measurement
Area, perimeter and volume
VIEW
Statistics
VIEW
Summer term
Geometry
Shape
VIEW
Geometry
Position and direction
VIEW
Themed projects, consolidation and problem solving

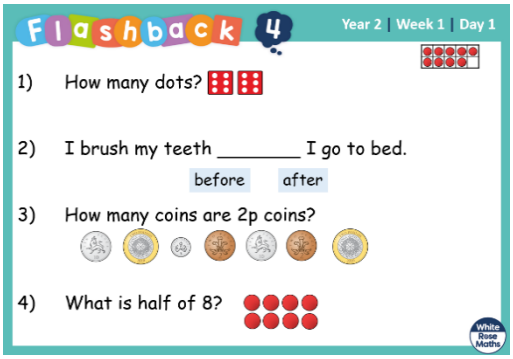
Small Steps Overview

The objectives are broken down into a series of carefully planned small steps. It is recommended to teach the small steps in the suggested order as the step sequences are designed to gradually develop children's understanding.



Flashback 4

Each Maths lesson should begin with a recap of prior learning using the 'Flashback 4' materials. These can be completed mentally, as a discussion or more formally in books if required in Key Stage 2. These questions are designed for pupils to 'Know more, remember more' as they are constantly revisiting previously taught material to practice key concepts and skills.



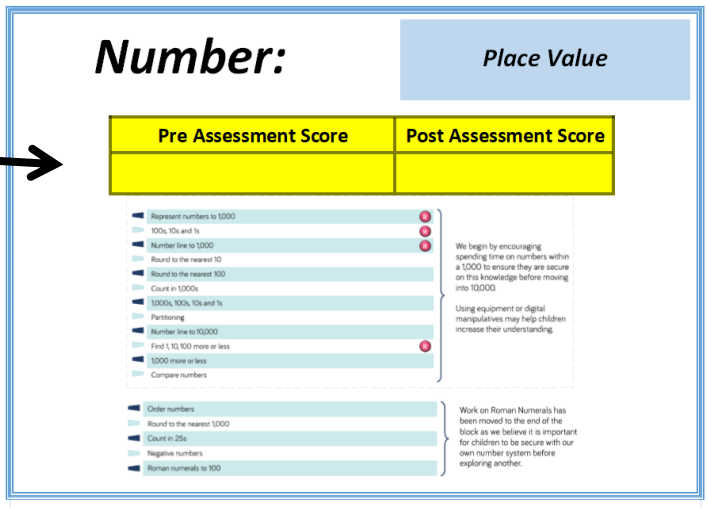
Unit Front Covers

At the beginning of each unit, a unit front cover should be stuck in each child's book. There is a template of a front cover saved on the server in Maths 2020-21 under 'Unit Front Covers' inside the Planning guidance folder. You can use and adapt these accordingly. (please add to the folder)

What to include on unit covers:

- Title of Unit – e.g. Number and Place Value
- Small steps being covered within the unit – these can be taken from WRMH schemes or Target Tracker
- Add pictures of expected criteria if you wish.

Ensure that positive dialogue is shared with children when providing them with Pre and Post assessment results from End of Block assessments.
Use results to guide any intervention needed towards children making progress.



Assessment

Maths Assessments	KS1	LKS2	UKS2
Baseline Wk2 Sept	Place Value pre assessment	Place Value pre assessment MTC baseline	Place Value pre assessment
Aut 1	Any relevant pre/post assessments for topics completed	Any relevant pre/post assessments for topics completed MTC	Any relevant pre/post assessments for topics completed Y6 Past SATs paper
Aut 2	WRM end of Autumn Arithmetic WRM end of Autumn Reasoning	WRM end of Autumn Arithmetic WRM end of Autumn Reasoning MTC	Y5 WRM end of Autumn Arithmetic Y5 WRM end of Autumn Reasoning Y6 Past SATs paper
Spr 1	Y2 Past SATs paper	MTC	Y6 Past SATs paper
Spr 2	WRM end of Spring Arithmetic WRM end of Spring Reasoning	WRM end of Spring Arithmetic WRM end of Spring Reasoning MTC	Y5 WRM end of Spring Arithmetic Y5 WRM end of Spring Reasoning Y6 Past SATs paper
Sum 1	End of KS1 SATs	MTC	End of KS2 SATs

Sum 2	Y1 NFER Maths paper 1 Y1 NFER Maths paper 2	MTC Y3 NFER Maths paper 1 Y3 NFER Maths paper 2 Y4 NFER Maths paper 1 Y4 NFER Maths paper 2	Y5 NFER Maths paper 1 Y5 NFER Maths paper 2

Note: pre/post assessments are to be completed at the start and end of each new unit in Maths using maths.co.uk., scores are to be updated on unit front covers in children's books as well as on the excel tracker on staff share.

Pre/Post Assessments

End of Topic assessments are provided by maths.co.uk. These are to be completed before the topic as a formative assessment, preferably during the first part of the Maths lesson, and repeated soon after the unit is completed as a summative assessment. Following any assessment on maths.co.uk, you will be provided with a fully comprehensive gap analysis for each child's score based on the split objective and national curriculum objective. There are multiple assessment options for each topic, you should use *test name* A at the start of a topic and *test name* B at the end of the topic.

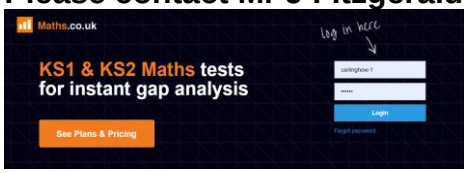
You should use the pre-assessment and matching gap analysis to inform your planning and interventions that will need to be implemented into your planning. If children are unable to answer any questions, pre teaching can occur. If children are able to answer most questions, they will be able to complete more reasoning and problem solving activities. In particular, when a child achieves highly in a unit pre assessment, materials from NRich Maths should be used as more open-ended problem solving and reasoning questions to deepen a child's understanding of a concept.

Please note down the children's pre-assessment score and post-assessment score on your unit front cover each time to show progress.

At the end of the assessment, the children are able to grade their confidence levels within the unit. Please use this to inform your planning.

SEN/ Low attaining children – please use the assessments from a previous year group, depending on the child's level. E.g. if they are a Year 4 child working at a Y2 level, you would use the assessments from Y2. If they score highly on these, they can complete the Y3 assessment. **Their daily work within the unit would reflect the objectives they should be working on.**

Please contact Mr J Fitzgerald (maths lead) if you require access to this platform.



Termly Assessments

At the end of every term, children need to complete a White Rose Maths progress check. There are two papers; an arithmetic paper and a reasoning and problem solving paper.

These tests are to inform your judgements on Arbor and inform future planning. At the end of the academic year, Year 1, 3, 4 and 5 will assess using the NFER tests. Every half term, teachers add their teacher judgement to Arbor, the school assessment system to provide an overview of where every child in in Maths and what they are on track to achieve.

Half termly Multiplication Tables Check Assessments

At the end of every half term, children in Year 3 and 4 need to complete a Multiplication Tables Check (MTC). These tests are to check children's readiness for the Year 4 MTC and to inform any interventions that may be required where early intervention can happen. Data will then be filled in on the Year 3 and 4 MTC tracker to monitor progress throughout the year.

Using Arbor

At the end of each half term, there is an expectation that teachers will use their knowledge and assessments made during the teaching of Mathematics to accurately assess children. This is done at the end of each half term, so that you have the information fresh in your head, tracking can be completed and any interventions required can be put in place.

When assessing children on Arbor, assess the units you have taught within that half term. Please ensure you look through children's books to find the evidence of children achieving each objective so that assessments are accurate. ***Pre*** and ***Post*** assessments as well as **end of term White Rose Maths assessments** should also be used to inform your judgement.

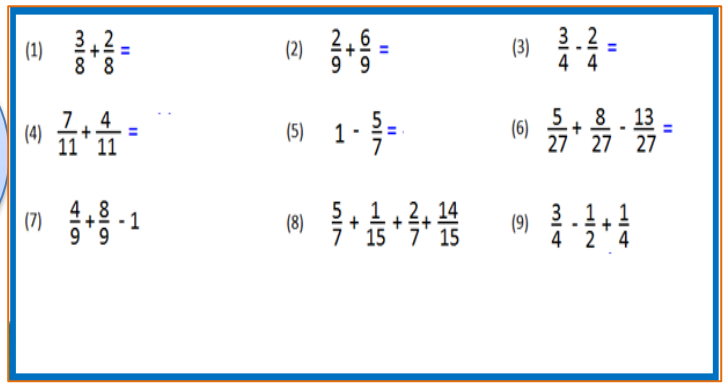
Maths Resources

All classrooms have been provided with resources to aid learning. Teachers need to confer with colleagues in advance if you need to borrow any resources in order to support a topic. Most maths resources are centrally located. If you are aware that resources are unavailable. i.e. are not in school then ensure that you make the Maths Lead aware and they will endeavour to obtain your request if possible. All teachers need to audit their classroom at the start of each term to ensure that they can request what they may need beforehand.
There are lots of online resources in the Maths folder on the server.

Coloured Boxes

We use WRMH Schemes to plan. These show a range of fluency, reasoning and problem solving activities that can be used to teach each objective. These schemes can be found on the server in the folder Maths 2020-21.
Children's independent work should be given in different coloured boxes; **Blue for fluency**, **Red for Reasoning** and **Purple for Problem Solving**. If you are doing a practical activity or work from a book, then place the corresponding colour in the top corner. These activities should be differentiated in order to support personalised learning. Once a child has completed fluency, they need to move onto reasoning within the lesson; **do not** wait until the next day to complete the next stage of learning. Each box should be stuck into children's books and children to complete the questions in their book and do the working out etc.

Fluency
This should consist of questions that get progressively harder. When setting these, consider the '3 and move on rule', unless they get progressively harder.
NB: You can include word problems in fluency.

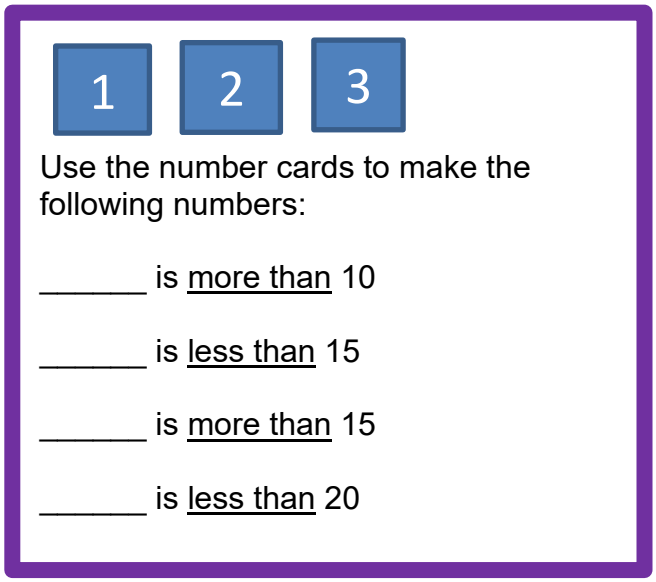


Reasoning
This is what children will move onto if they are successful with

Henry has one counter and a place value grid. He says he can make a one, two, three and four digit number.
Is he correct?
Show this on a place value grid.

Problem Solving

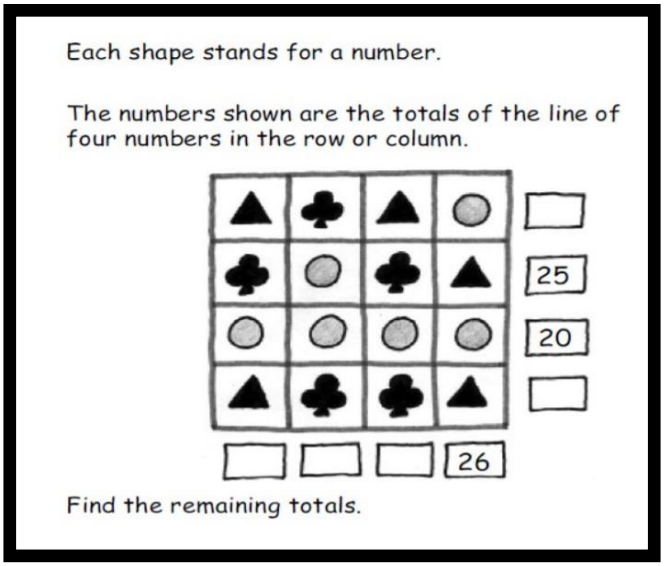
There are two main types of problem solving questions – ones that have a definitive answer and open ended problems that have many answers.



Within the daily mathematics lesson teachers provide activities to support and challenge children who are abler in maths. They are taught within the daily mathematics lesson and are able to take part at their level through the challenge of the activity, sometimes with the support of a Teaching Assistant and other appropriate activities and resources which the teacher plans into the daily maths lesson.

Greater Depth

Endeavour to meet the needs of higher ability children through careful identification to enable them to show aptitudes and quality of thinking.

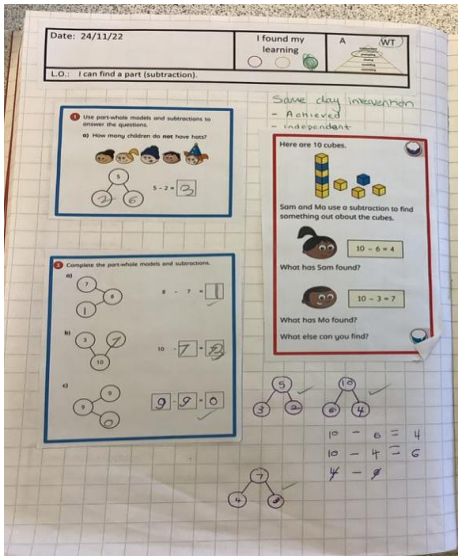


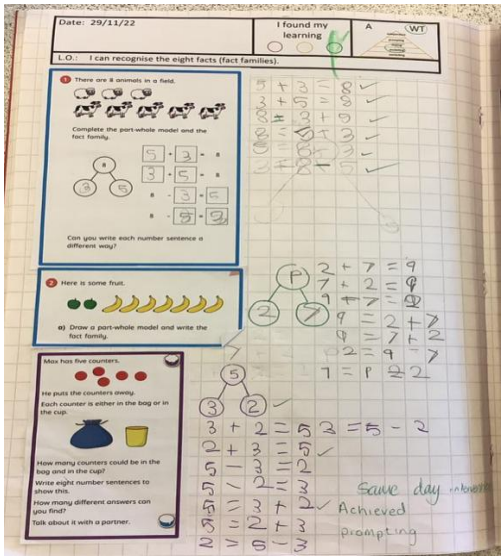
‘Keep Up not Catch up’ (Same Day Intervention)

At Carlinghow Academy we strive for all of our children to become successful problem solvers and resilient mathematicians. We want our children to have a strong and secure mathematical knowledge that will give them the correct foundations for later life. One way we strive for this is through ensuring that

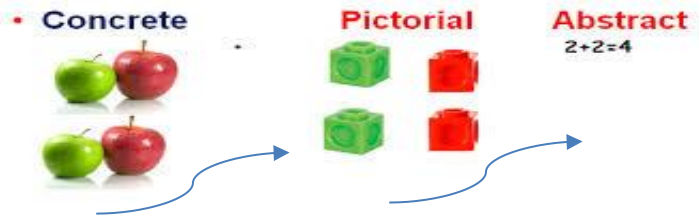
children keep up and not catch up using same day interventions. We use same day interventions to ensure that children are given additional practice in a smaller group. We evidence this in books through writing 'Same Day Intervention' the amount of support that was given to the child for them to succeed and whether they have now achieved the objectives of the lesson. Same day interventions that are from a practical lesson or require the child to only use concrete manipulatives to achieve the objectives could be evidenced underneath the learning objective: Same day intervention – see seesaw.

Examples:





Concrete, Pictorial and Abstract



The CPA method involves **using actual objects for children to add, subtract, multiply or divide**. **They then progress to using pictorial representations of the object, and ultimately, abstract symbols.**
Children often find maths difficult because it is abstract. The CPA approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and tangible way.

Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves. Every new abstract concept is learned first with a 'concrete' or physical experience.

Pictorial is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems.
Once a child has demonstrated that they have a solid understanding of the 'concrete' and 'pictorial' representations of the problem, the teacher can introduce the more 'abstract' concept, such as mathematical symbols.
Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, –, x, / to indicate addition, subtraction, multiplication or division.

Problem: There are 8 flowers in the vase. Hannah has 2 flowers in her hand. How many flowers are there altogether?		
Concrete	**Pictorial**	**Abstract**
Using actual flowers and then moving onto using counters, cubes, Numicon etc. to represent the flowers.	Use drawings of flowers, or pictures of objects such as multi-link blocks or counters, to represent the actual object. You could also use diagrams to support learning such as bar models and part/whole models. Use the Calculation Policy to get ideas.	8 + 2 = When doing abstract, consider moving the equals sign around and using missing numbers in the sum. ___ = 8 + 2 2 + ___ = 10 ___ + 8 = 10

Resources

In order to support the delivery of maths lessons to all pupils the school has a range of resources available. Within the classroom each set of tables should have maths resources available to children at all times, these include basic resources such as number lines, 100 squares, rulers, counters, numicon, etc. Other specific resources (eg, balance scales, meter rulers) are stored in our central resource near the conference room, here equipment is freely available for teachers to borrow as the lesson requires.

Differentiation

At the beginning of each unit, after completing the pre/post assessments, children should be mixed with children who have shown to have ability to support their peers. Teachers should monitor this through 'First Quality Teaching'.
Pre-teaching should be adopted to ensure child has the best possible chance to succeed in future learning objectives. We must remember that a child may have a better understanding of time than they do of division and should never be grouped. All lessons should allow children to work through the objectives and encouraged to engage in completing a range of fluency, reasoning and problem solving activities.

Objectives should be written using the correct mathematical language and they need to be specific to the skills that are being taught. Objectives should be written in child speak using 'I can'.
Here is an example of effective differentiation in Year 3.

Support	Core	Extend
Y2 Objective **Write simple fractions. e.g. ½ of 6 = 3 and recognise the equivalence of 2/4 and ½**	**Y3 Objective** **Recognise and use fractions as numbers: unit fractions and non–unit fractions with small denominators.**	**Y3 Objective** **Recognise and show, using diagrams, equivalent fractions with small denominators.**
I can find, name and write fractions of a length, shape, set of objects or amount,	I can find and use fractions of numbers.	I can identify and show equivalent fractions.

NRICH

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. *NC2014*
Therefore, it is necessary to make our lessons purposeful and involve real life problems into our lessons. Nearly every other task on the NRICH site fits most of the criteria for a rich problem. You can access these links located in the Resources folder "NRICH_PS_Curriculum map_links. Each problem provides you with the teachers' notes so you can get a sense of how a lesson might proceed, but, given the freedom to do so, children can take the question in an unexpected direction so you may be surprised at the outcomes. If you can be open to such results, not only will your children learn more and become more independent, but you will be helping them to see mathematics as the creative subject it is.

Number Detective

Age 5 to 11 ★

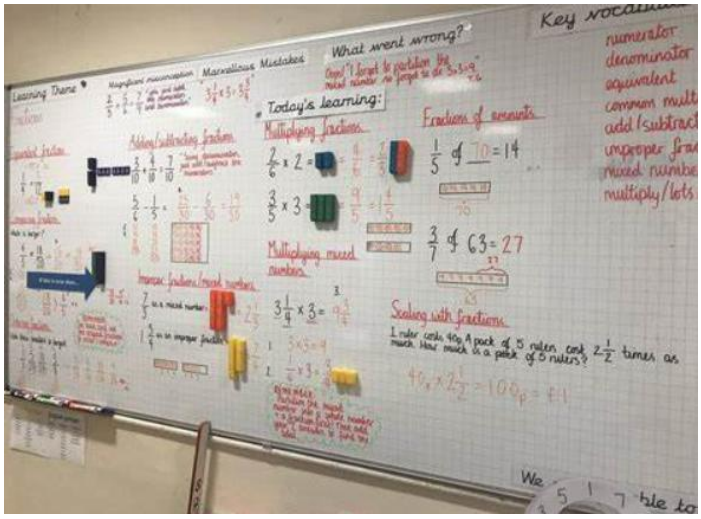
Calling all detectives! You will need to think creatively, use your reasoning skills and your problem solving strategies to find the mystery number from the list below.

- The number has two digits.
- Both of the digits are even.
- The digit in the tens place is greater that the digit in the ones place.
- The ones digit is not in the three times table.
- The tens digit is not double the ones digit.
- The sum of the two digits is a multiple of five.

Working Walls

Working walls should:

- Be relevant to the unit you are teaching
- Be clear and informative
- Have the key vocabulary for the unit displayed
- Have calculations modelled by the teacher – as per the Calculation Policy
- Show the journey through concrete, pictorial and abstract
- Show the journey through fluency, reasoning and problem solving



- Give prompts and reminders children can use to support their learning

Times Tables

Times Tables Check

All Y4 children will have their multiplication skills formally tested from 2020.

Primary-school children are expected to know all their times tables up to 12x12. Under the current National Curriculum, children are supposed to know their times tables by the end of Y4,

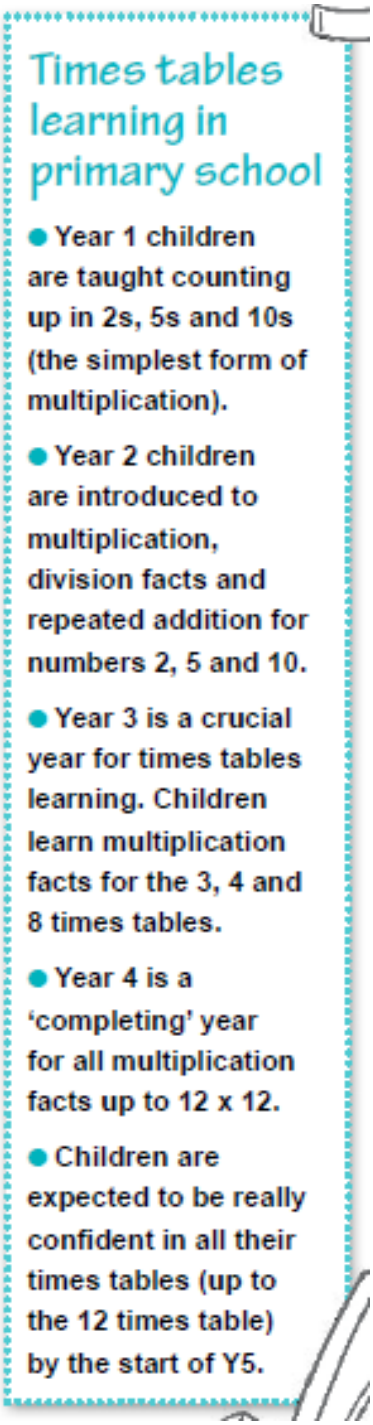
TTRockstars

Key Information

- Each teacher and child creates their own rock star avatar and name.
- Students can earn coins by practising timetables and completing in online competitions. With the coins, they can buy new accessories for their avatar.
- **Setting the tables** – You can set which tables the pupils face each week in the Garage and Arena games by going to My School > Pupil Setup > Set Schedule.
- Children should be completing 10 studio games each half term to update their rock speed. This should then be used on your TTRockstars display.
- There are four game types; Garage, Studio, Arena and Festival. The garage is the best place to improve their score. The studio is the best place for obtaining a rock speed.

For more information on TTRockstars visit:
https://ttrockstars.com/page/features

Type	No. of players	Questions	Coins	Comments
Garage	Solo	Teacher controlled	10	Best place to improve.
Studio	Solo	Up to 12×12	1	Rock speed is calculated here.
Arena	Multi	Teacher controlled	1	Only classmates can play against each other
Festival	Multi	Up to 12×12	1	Open to the whole world.



Think Pinks/ Next Steps

Here are some examples of effective 'Think Pinks' you can use.

- **'Draw it'** Draw a picture to explain or demonstrate how you have worked it out. Be careful with this one - children need to be trained to do this effectively!
- **'What's the question?'** If this is the answer, what is the question? Could there be more than one question?
- **'Empty box question'** What goes in the empty box(es)?
  Such as _____ + 4 = 7, ___+___ = 9
- **'Prove it!'** Convince me that you are right.
- **'Tell a story'** Make up a real-life story using your equation/numbers or shapes. Try to use the star words.
- **'Before and after'** What came before? What comes next? Explain how you know.

- **‘Find a pattern’** Can you see a pattern in the numbers? Can you see a pattern in the answers? Continuing this pattern, what would happen if...?
- **‘What’s wrong with this?’** Can you explain what is wrong with the example below and correct the error?
- **‘Reason it’** Explain to your partner how you know. Remember to use the star words!
- **‘Odd one out’** Find an odd one out and explain why it doesn’t fit. Does your partner agree with you? Could another one be the odd one out? Why?

Next Steps …

Should	Should Not
Move children on to their next step of learning. Challenge the children further. Correct number formation. Address misconceptions. Link to their pre assessment. Link to the objectives in the unit.	Be more of the same. Move them on too quickly. Give them the answer. Be too basic. Tell children to do corrections. Tell children to complete think pinks. Have spelling mistakes.

Presentation/Calculation Policies

Presentation

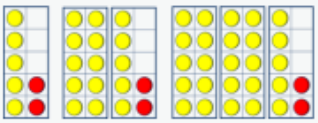
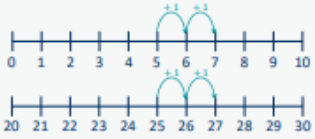
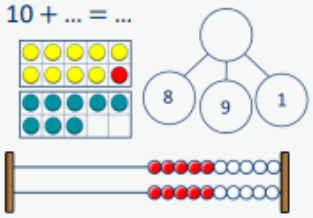
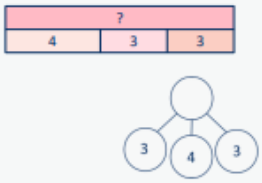
Children should be encouraged to use the squares in their books for any formal written calculations such as column addition/subtraction or long multiplication/division. Children in Key Stage 1 should begin by being taught to use 1-digit per square when writing number sentences in their books to build high levels of presentation in their learning. When formal written methods such as column addition/subtraction is introduced in Year 2 (once children are ready and have a secure understanding of addition/subtraction crossing 10 using concrete manipulatives and pictorial representations) teachers will use their teacher judgement to decide on when it is most appropriate for children to write on a worksheet or directly into their books which will be continued through Key Stage 2.

Calculation Policies

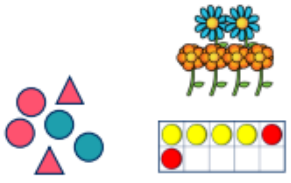
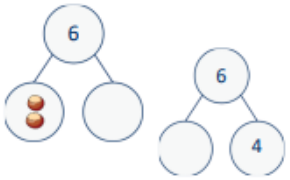
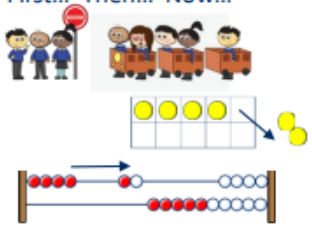
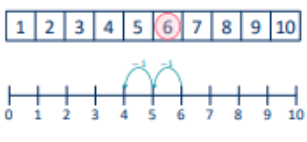
For the full calculation policy, please go to staff share -> curriculum -> 2023/24 -> Maths -> Calculation Policies. At the start of each policy, there is an overview of the different models and images that can support the teaching of different concepts. These provide explanations of the benefits of using the models and showing the links between different operations. Below are examples taken from the calculation policy which you may find beneficial when encouraging children to write directly into their maths books or set out any formal written methods.
Calculation policies saved in staff share, provide an overview of the progression of skills at the start of each of the four sections: addition, subtraction, multiplication and division (calculations involving decimal numbers and fractions are included).
The calculation policy follows the CPA approach which is one of the ways we teach children to be fluent mathematicians. Stem sentences and key questions are also included alongside key representations.

Addition

Year 2	• Recall and use addition facts to 20 fluently, and derive and use related facts up to 100
	• Add numbers using concrete objects, pictorial representations, and mentally, including:
	  • a two-digit number and 1s
	  • a two-digit number and 10s
	  • 2 two-digit numbers
	  • adding 3 one-digit numbers
	• Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.		

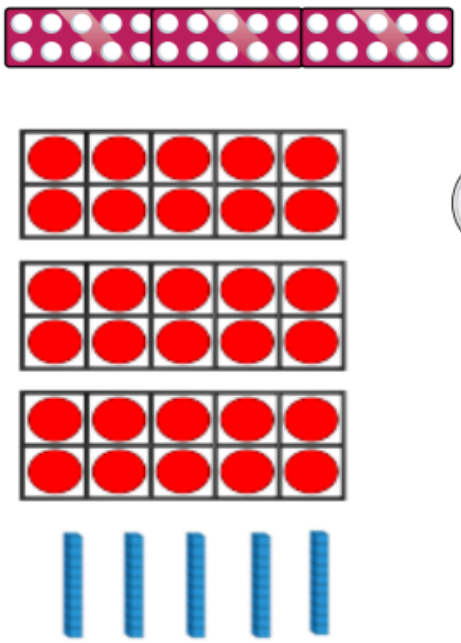
Progression of skills	**Key representations**		
Add ones to any number (related facts) Make links to known facts.	I know that … and … = … so … and … = … 	… more than … is … so … more than … is … 	What do you notice? Can you continue the pattern? 5 + 2 = 7 15 + 2 = 17 25 + 2 = 27…
Add three 1-digit numbers Prompt children to understand that addition can be done in any order and to make links to known facts.	… and … are a bond to 10 10 + … = … 	Double … + … = … 	What do you notice? Which addition is the easiest to calculate? 8 + 9 + 1 = 8 + 1 + 9 = 9 + 1 + 8 =

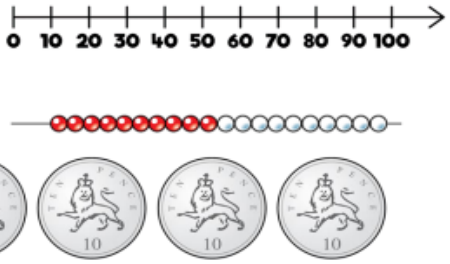
Subtraction

Year 1	• Read, write and interpret mathematical statements involving subtraction (–) and equals (=) signs. • Represent and use number bonds and related subtraction facts within 20 • Subtract one-digit and two-digit numbers to 20, including zero. • Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9		
Progression of skills	**Key representations**		
Find a part Link to number bonds and known facts. E.g. 2 + 4 = 6 so if 6 is the whole and 4 is a part, the other part must be 2	There are … in total. … are … How many are **not** …? 	… is the whole. … is a part. … is a part. 	… subtract … is equal to … … is equal to … – … 6 – 2 = 4 6 – 4 = 2 4 = 6 – 2 2 = 6 – 4
Take away A quantity is decreased.	First… Then… Now… 	I start at … I jump back … I land on … 	… minus … is equal to … … is equal to … – … 6 – 2 = 4 6 – 4 = 2 4 = 6 – 2 2 = 6 – 4

Times Tables

Skill: 10 times table	Year: 2





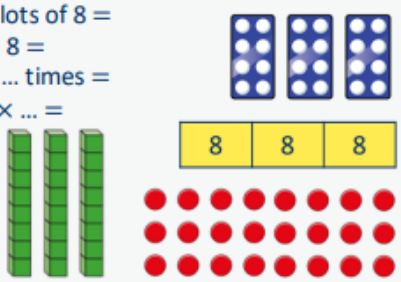
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

Multiplication

Progression of skills	Key representations
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	… lots of 8 = × 8 = 8, … times = 8 × … =
Related facts Use knowledge of multiplying by 10 to scale times-table facts.	… × … ones is equal to … ones so … × … tens is equal to … tens.
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	… tens multiplied by … is equal to … tens. …ones multiplied by … is equal to … ones.



… times 8 is equal to …

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30

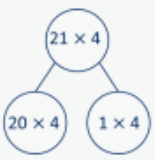
3 × 8 = 24 24 = 3 × 8

3 × 4 = 12
3 × 40 = 120

Tens	Ones

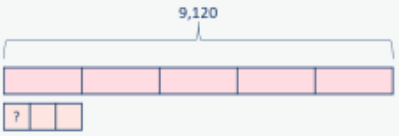
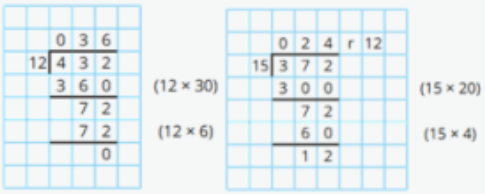
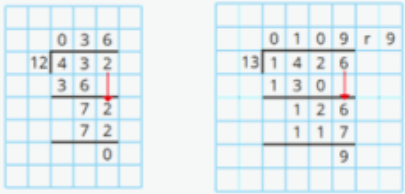
30 × 2 = 60
2 × 2 = 4

32 × 2 = 64



Tens	Ones

Division

Progression of skills	Key representations
Mental strategies Include partitioning and number line strategies outlined in Y5 as well as division using factors.	To divide by … , I can first divide by … and then divide the answer by … 240 ÷ 60 = 240 ÷ 10 ÷ 6 240 → ÷ 10 → □ → ÷ 6 → □ 480 ÷ 24 = 480 ÷ 4 ÷ 6 480 → ÷ 4 → □ → ÷ 6 → □ 9,120 ÷ 15 = 9,120 ÷ 5 ÷ 3 
Long division The long division method is introduced for the first time. Two alternative methods are shown.	Method 1  Method 2 
Order of operations Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction.	… has greater priority than …, so the first part of the calculation I need to do is …   (6 + 4) ÷ 2 = 5  6 + 4 ÷ 2 = 8

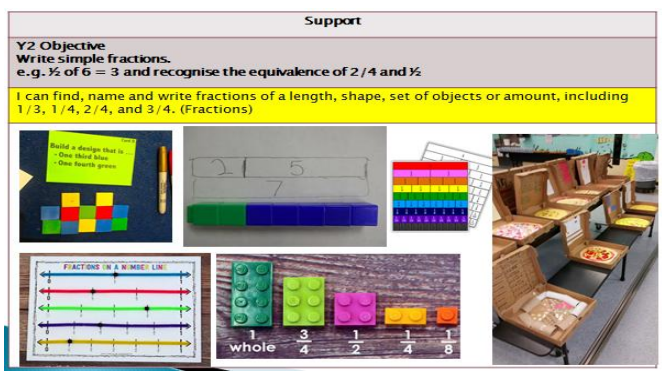
Book Scrutiny Feedback

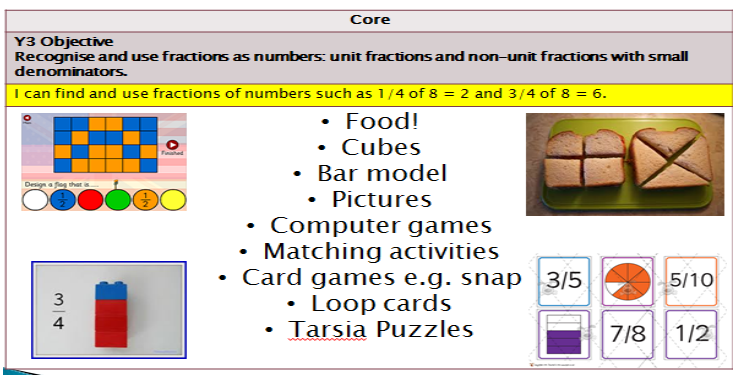
Evidence will be looked for in the following areas. Feedback is given as per our marking policy; green for positive evidence found and pink for next steps.

Fluency, reasoning, problem solving	Concrete, pictorial, abstract	Presentation	Challenge and varied questions	Clear steps in learning-sequence	Marking and feedback-next steps impact	Actions since last scrutiny

Making Maths Exciting

We want our children to enjoy maths and we know that children learn best when they are engaged and excited about their learning. Real life activities support their problem solving skills. Below are some ideas of how you can 'think outside the box' when planning your maths sessions and make them as practical and active as possible.





Cross-Curricular Maths

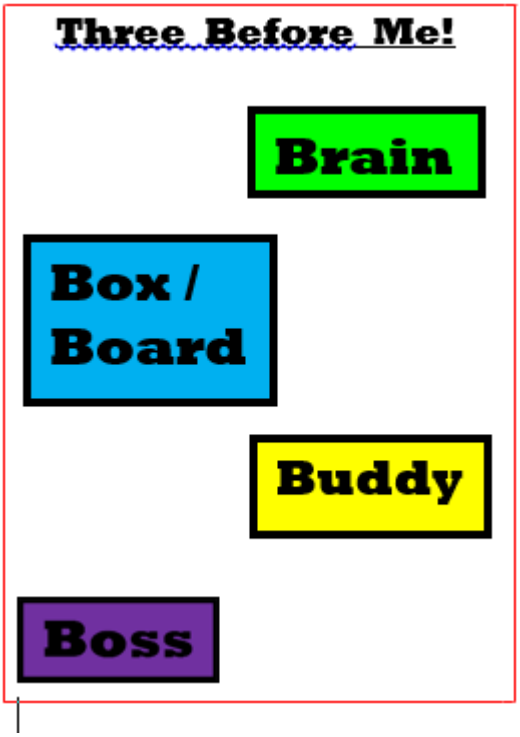
Some of your topics throughout the year will provide lots of opportunities to explore and teach real life mathematics. Please complete at least two cross curricular maths sessions each half term. These can be done during any lesson, it does not have to be in just maths or topic lessons. Cross curricular maths should be completed in your Topic book. If this is completed during a maths session, please write a note in each maths book – e.g. "Date + Please see topic book."

Examples of cross-curricular maths

History – Timelines, finding the difference between dates/ periods of time, Roman Numerals, time, money
Geography – scales, population, shape, data handling, money, co-ordinates
Science – Measurement, data handling, weight
PE – Time, measurement, estimation, data handling, counting
Art – Shape, area and perimeter, angles

	• Treasure maps – co-ordinates • Pirate problem solving • Time – how long does it take to get to the next island? • Counting treasure – money and times tables.

Three Before Me



- These are to promote independent learning in all subjects.
- These are personalised. Take photographs of your class for each stage.
- There are speech bubbles that should be displayed around the poster that remind children of what to do for each step. These can be found on the server in the Maths 2020-2021 folder > Three Before Me.
- Please remind children to use these steps on a regular basis at first so that it becomes second nature.

Useful Resources

• White Rose Maths- For planning, resources and challenges
https://whiterosemaths.com/

• Classroom secrets- Has resources linked to White Rose Maths
https://classroomsecrets.co.uk/

• Primary stars- Has resources linked to White Rose Maths
https://primarystarseducation.co.uk/

• NCETM
https://www.ncetm.org.uk/

• NRICH
https://nrich.maths.org/

• TWINKL- Has resources linked to White Rose Maths
https://www.twinkl.co.uk/

• Ten Town- For EYFS
https://tentown.co.uk/

• TT Rockstars- for times table knowledge
https://ttrockstars.com

• Hit the Button – for number bonds to 10, 20, & 100
https://www.topmarks.co.uk/maths-games/hit-the-button