Maths at Spire Junior School

Overview of the Subject:

The central aim of our school curriculum is to develop the whole child and shape their minds for positive learning experiences about the world around them. We strongly believe in encouraging curiosity, exploration and developing a strong sense of self-identity.

Mathematics is a creative subject that lends itself to so many other disciplines, therefore, over the centuries it has provided some responses to some of history's most fascinating problems. Mathematical knowledge, and the skills acquired through developing an understanding of these, is vital for everyday life. Likewise, the subject is critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. Without a high-quality mathematical education, children are sent into the world ill-equipped for life.

Intent:

In order to ensure that all children, no matter of starting points, progress and are challenged, they need access to concrete, pictorial and abstract (CPA) resources. By using this approach to scaffold and challenge the children appropriately, all can be working from a learning intention that is suitably taken from the curriculum but can be accessed independently. To promote the use of mathematical language, KAGAN cooperative learning routines are added to planning when applicable to provide children with the opportunities to share learning and a platform for all to share (not just the more able or confident). As a school we folllow the White Rose Mixed-Age schemes of learning. From this scheme of learning, long-term plans are structured so that associations can be made from prior learning to the next steps. These are used in conjunction with NCETM progression maps & ready to progress criteria so that teachers are aware of previous and post-year group expectations. We teach maths with a mastery approach, aiming for our children to 'keep up, not catch up.' Rapid graspers are challenged through deeper learning challenges that offer rich and sophisticated reasoning and problem-solving, whereas those who need more time to practice fluency, have the time through assessment for learning.

Implementation:

Due to being a fully mixed aged school, our curriculum at Spire follows the White Rose Mixed-Age schemes of learning. This is broken into two schemes - Mixed-Age Year 3 & 4 and Mixed-Age Year 5 & 6. Both are single year schemes that students repeat each year. Each lesson has two differentiated packs of work and students complete the pack for their year group. Appropriately scaffolded work is provided for those not working at age-related expectations. These schemes of learning are carefully planned, mapped to the National Curriculum objectives and organised so as to promote a deep understanding of the projects and concepts that we cover through quality first teaching. We do this by equipping our pupils with the skills and qualities they need to thrive both within the curriculum and within the wider-world.

At Spire Junior School, Children study mathematics daily covering a broad and balanced mathematical curriculum including elements of number, calculation, geometry, measures and statistics. Within these daily maths sessions, 6 in 6 (6 mathematic questions completed in 6 minutes) activities are completed to build fluency and precision and to think about numbers in a different way. Due to the interconnected nature of mathematics, at Spire Junior

School we aim to teach maths in a cross-curricular manner as well as discretely to teach the practical application of mathematical skills. We focus not only on the mathematical methods but also emphasise mathematical vocabulary and to use Maths Mastery to broaden and deepen mathematical understanding.

We aim for each child to be confident in each yearly objective and develop their ability to use this knowledge to develop a greater depth understanding to solve varied fluency problems as well as problem solving and reasoning questions. Each lesson has an out-of context, reasoning and problem solving question alongside reasoning and problem solving activites that are incorporated into that day's learning. We use a range of resources throughout the school to ensure a curriculum that is specific to each child's learning needs. All children have a Times Tables Rockstars account and they are encouraged to access this online programme at home, which aims to build pupil engagement and consolidate vital times-tables knowledge. This programme also aids children to prepare for an online multiplication tables check (MTC) to year 4 pupils, which became statutory for children in the academic year 2019/20. The purpose of the MTC is to determine whether pupils can recall their times tables fluently, which is essential for future success in mathematics. It will help schools to identify pupils who have not yet mastered their times tables, so that additional support can be provided.

Impact:

We are confident our curriculum is successful in the teaching and learning of reading through a variety of monitoring and feedback activities which have taken place through school.

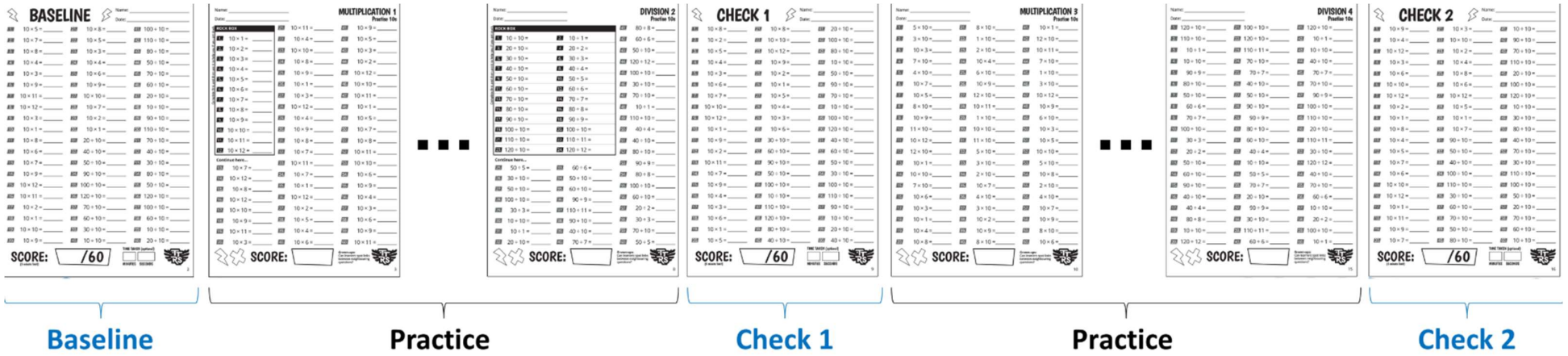
Throughout each lesson formative assessment takes place and feedback is given to the children through marking and, where necessary, next step tasks to ensure they are meeting the specific learning intention. Teacher's then use this assessment to influence their planning and ensure they are providing a mathematics curriculum that will allow each child to progress. The teaching of maths is also monitored on a termly basis through book scrutinies, learning walks and lesson observations. Each term children complete a summative assessment (NFER with the exception of Year 6, who use a previous SATs papers) to help them to develop their testing approach and demonstrate their understanding of the topics covered. Question level analysis is completed for each roubd of summative assessment. This enables leaders and class teachers to identify gaps in knoweledge that need to be closed during lessons and interventions. It also gives staff the opportunity, triangulated with book-looks and learning walks, to assess the quality of the curriculum on offer for our students. The results from both the formative assessment and summative assessment are then used to determine children's progress and attainment, which is added to an online programme which can generate patterns and trends. Within school, the summative data is tracked on Insight whereby analysis can be completed.

Lesson Structure

Times Tables

The majority of our Maths lessons happen between 08:45 and 10:00. The first 15 minutes of our maths lesson are dedicated to learning our times tables. This discrete, daily session is split into two parts: a teaching element consisting of games or songs followed by a practice element where each class uses the Times Tables Rock Stars paper worksheets.

Each round of TTRS worksheets follows the same pattern.



Students are given 5 minutes to complete the baseline and checks while they are given 3 minutes to complete the practice sheets. The scores for each baseline and check are recorded on their Times Tables Rock Stars profile, contributing to their heat map - an interactive tool showing the average speed taken to complete each question.

Our year 3 and 4 classes begin learning the 3s, 4s & 8s before moving onto the 6s, 7s & 9s and finally the 11s and 12s. Our year 5 & 6 students complete the times tables that their class teachers have identified through their heat-maps. Those who need to are given the opportunity to learn the 2, 5 and 10 times tables.

6 in 6

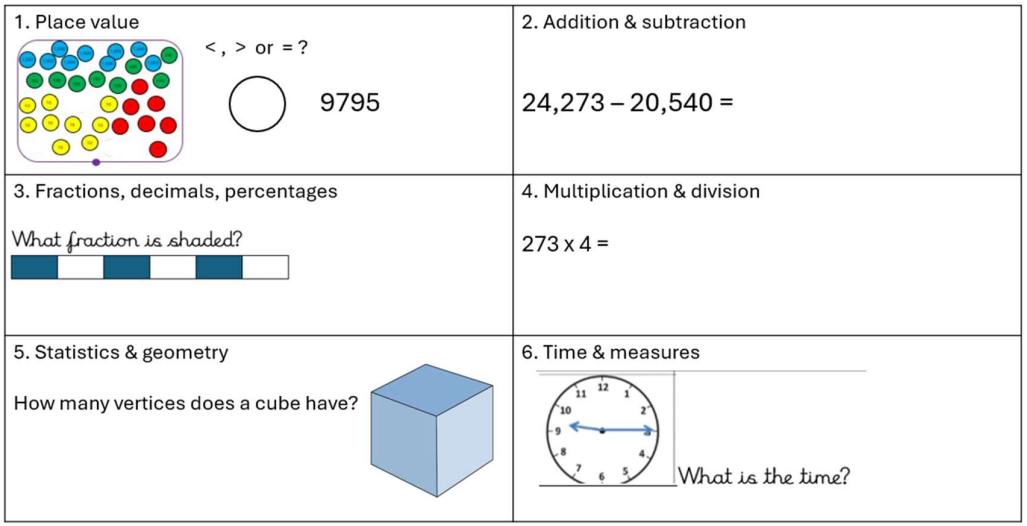
Each maths lesson begins with a 6 in 6 activity. 6 questions are to be completed in 6 minutes. For the majority of our students this is displayed on the class interactive whiteboard and is completed by students on their individual whiteboard. The 6 questions are then marked, and AFL takes place by showing the class teacher their responses.

- Builds up over the year. If a topic has not been covered in a year group, an age-related question from the previous year group is used.
- Teachers choose how you they are used. It can be something from the current unit of learning, to check prior understand of something about to be taught, or as a way of revisiting previous learning ensuring foundational knowledge is retained.
- They always follow the same layout.

1. Place value	2. Addition & subtraction
3. Fractions, decimals, percentages	4. Multiplication & division
5. Statistics & geometry	6. Time & measures

- A differentiated version is provided for students working below are-related expectations and a 4 in 4 is provided for students working on formative footprints.

Example 6 in 6.

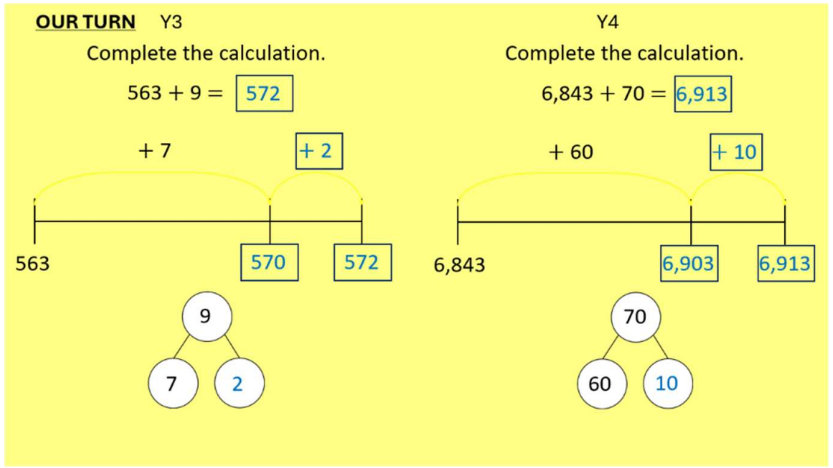


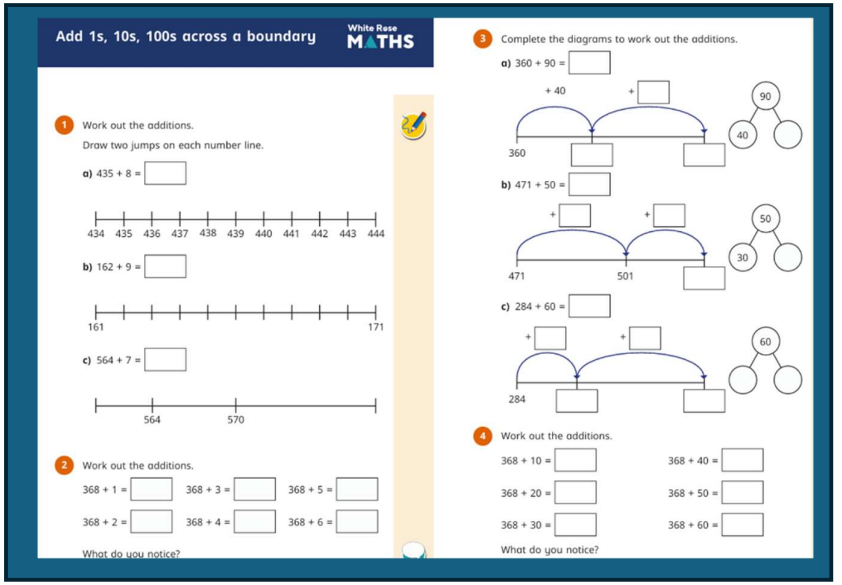
Daily Reasoning Problem

A daily reasoning and problem-solving problem is then provided. The objective of this is to work collaboratively to discretely practice the skills of reasoning and problem solving. Staff can choose what topic to cover in these problems. What they are modelling is the skills of tackling reasoning and problem solving questions. Children complete these on whiteboards and show the teacher their responses.

Main lesson and independent work

The lesson presentation used by teaching staff is an adapted version of the teaching slides provided as a part of the White Rose Scheme of Learning for the step to be learned that day. Staff at Spire Junior School are conscientious consumers of the scheme and they choose the elements that best serve the learning of our students. Today's date and learning intentions are written into books. As well as the teaching element of the lesson, promoting the foundational knowledge needed, an array of examples of questions are chosen that closely match the independent work to be completed by the students. There will be explicit modelling of each type of question following a 'my turn, our turn, your turn' pattern. Worked examples from the lesson presentation are completed by students on individual whiteboards. Each lesson will provide student with a varied mixture of KAGAN co-operative learning strategies and AFL techniques. Independent work is also provided from the White Rose Scheme of Learning for the small step covered in that lesson. Where possible, students will complete their work in their maths books. At Spire Junior School, we feel that it is important that our students learn to set out their work independently and are able to make sensible choices over ways to present answers instead of being constrained by worksheets. Where possible, independent work is interspersed with instruction.



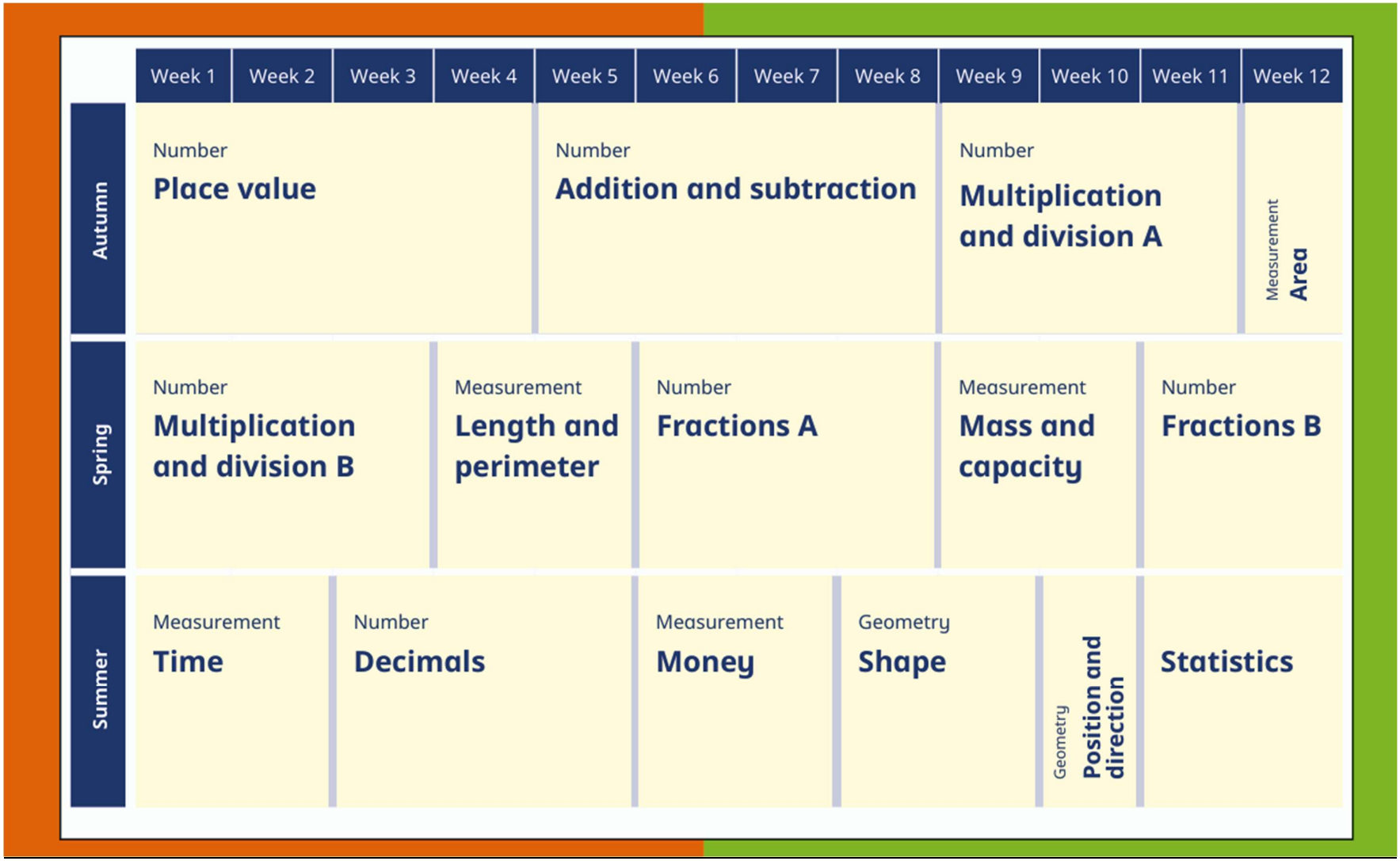


Marking and feedback

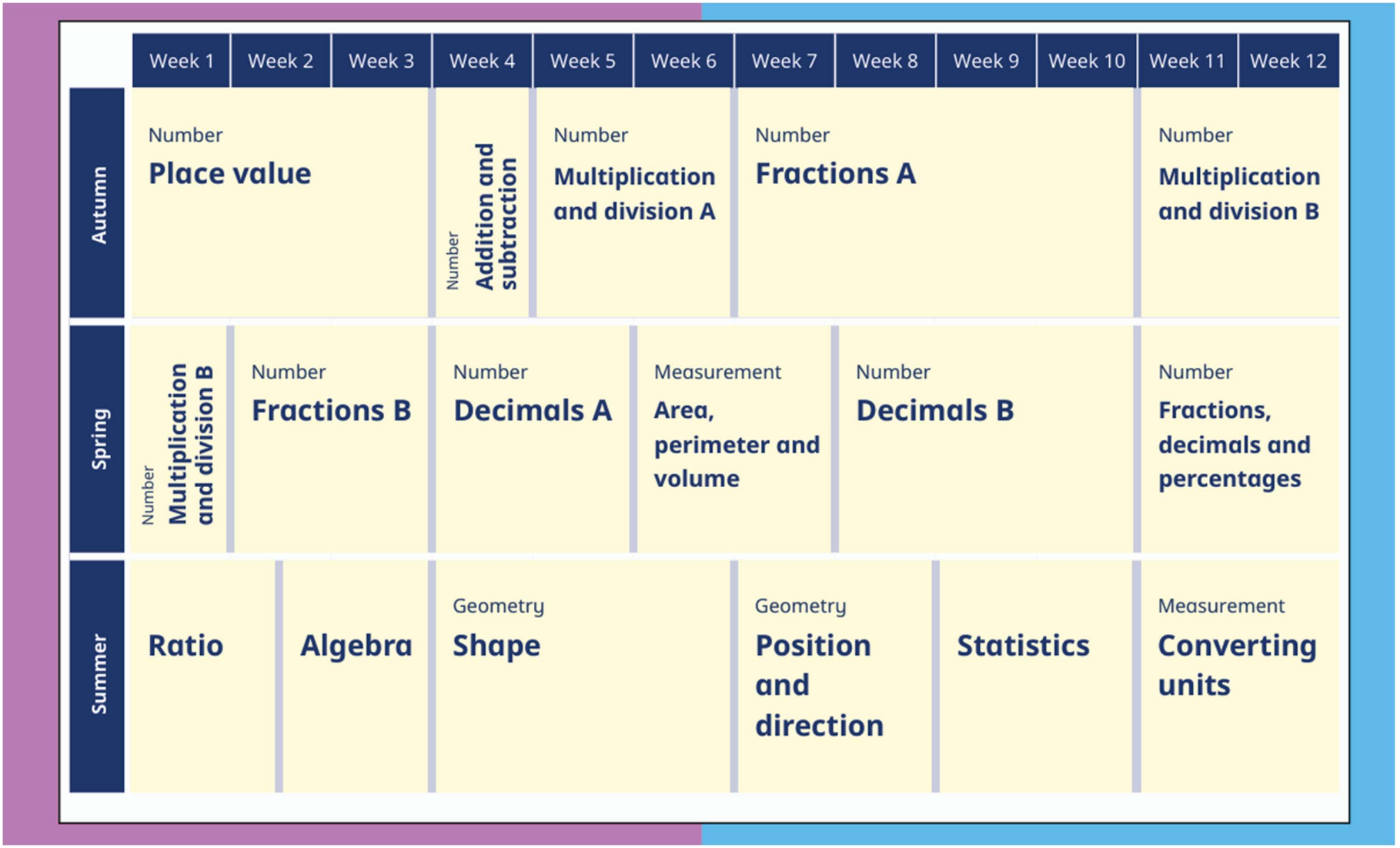
Marking and feedback are conducted in-line with our school feedback policy. It is recognised that it is not productive for an adult to always mark in isolation from the children, and nor should it be an onerous task. We value verbal feedback as highly as any written form. Where appropriate (in pure number work for example) the children will be encouraged to self-mark with support and guidance from the teacher and will self-assess all written work with their pink pen. The teacher then checks the child's assessment. Adults may see fit to provide children with an example of how to set tasks out or provide a short challenge. Before deciding on a mode of feedback for a particular piece of work, adults should consider its relative impact. Children are to be given time to respond to their teacher's comments, especially where they have been set a short task to complete, or to make corrections. Where appropriate, children are encouraged to check computational exercises with the inverse operation or via a calculator. This can further encourage independence in the children, who can then seek help if they are unable to locate and correct their errors.

Curriculum Overview

Year 3 / 4 Mixed Age Group Suggested Curriculum Overview



Year 5 / 6 Mixed Age Group Suggested Curriculum Overview



Small Steps

(Example Year 3/4 Autumn Block 1 - Place Value)

Each unit of work comprises of small steps that break the National Curriculum content into 'lessons' complete with activities for each year group and teaching resources. As conscientious consumers of a scheme, the teaching staff in each year group, decide how best to meet the need of their learners. One lesson per week will be dedicated to fluency and arithmetic to practice key skills to aid the retention of foundational knowledge. Before the start of each unit of work, how each of the small steps will be covered is planned out. For example;

Monday	Tuesday	Wednesday	Thursday	Friday
Step 1 & Step 4 Thousands, Hundreds, Tens, Ones	Step 2 & Step 5 Represent numbers to 1,000 & 10,000	Step 3 & Step 6 Partition numbers to 1,000 and 10,000	Step 7 Flexible partitioning	Fluency / Arithmetic
Step 8 Find 1, 10, 100, 1,000 more or less	Step 9 & Step 10 Number lines to 1,000 and 10,000	Step 11 Estimate on a number line	Step 12 Compare numbers	Fluency / Arithmetic
Step 13 Order numbers	Step 14 Round to the nearest 10	Step 15 Round to the nearest 100	Step 16 Round to the nearest 1,000	Fluency / Arithmetic
Step 17 Round to the nearest 10, 100, 1,000	Step 18 Roman numerals	Consolidation	Consolidation	Fluency / Arithmetic

Assessment in Maths

At Spire Junior School, we assess mathematics to inform future planning. We look to identify knowledge gaps in our students so that they can be closed through the use of TA and teacher-led interventions and by adapting planning to meet these needs. Assessment is split into two parts, formative and summative assessment.

Formative Assessment

Assessment for learning will take place consistently throughout maths lessons using key techniques taken from Rosenshine's Principles in Action. They will include but are not limited to; cold calling, whole class responses on whiteboards, 'say it again better', partner work & no opt-out. The independent work completed by students will be marked and where a student has achieved the learning intention for that lesson is marked against the LI in their books. If a student has not achieved the learning intention, they will be included in the next intervention or if enough students do not achieve the learning intention, planning will be adapted.

Summative Assessment

Summative assessment in maths is conducted according to the following schedule.

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	NFER Baseline			NFER		NFER
Year 4		NFER		NFER		NFER
Year 5		NFER		NFER		NFER
Year 6	Past SATs Paper	Past SATs Paper	Past SATs Paper	Past SATs Paper	SATs Tests	

Years 3 complete a baseline NFER assessment in the first term of their time at school. This identifies gaps in prior learning to be rapidly addressed. Question level analysis is conducted after each round of summative assessment. Results of the analysis are interrogated at pupil progress meetings, intervention groups for the following half term are identified and planning is informed. Formative Footprints are used to assess and monitor the progress of our SEND pupils.

The learning environment

Working walls

These will display the following:

- These must reflect current (daily learning)
- They must include a model – these could be taken from the calculation policy
- They must include key vocabulary
- They must include prompts that show pictures and numbers (pictorial and abstract)
- They must be presented in child friendly language

There is an expectation that there will be concrete resources such as cubes, Deines and Numicon in each classroom, tens frames and part-whole models. These should be accessible to the students.

Formation of number

Children are to write one digit in each square. The numbers should be formed consistently and precisely. Children should write a one as a vertical line down e.g. 1. The number two shouldn't be looped at the bottom and written as so 2. The four should be created as two separate lines and not joined at the top and the seven should be formed as so 7. Letterjoin will be used as the primary font for this.

SEND in Maths

Cognition and Learning		Communication and Interaction	
Subject Concerns for SEND	Provision for SEND	Subject Concerns for SEND	Provision for SEND
- Weak Number Sense: A fundamental inability to instantly recognize "how many" items are in a set (subitizing) or understand relative quantity. - Working Memory Deficits: Children often forget the next steps in a multi-step calculation or lose track of numbers while counting - Poor Fact Retrieval: Difficulty memorizing basic arithmetic (such as times tables or number bonds) requires students to expend excessive mental energy just to count on their fingers, leaving little brainpower for deeper problem-solving. - Visual-Spatial Difficulties: Problems interpreting spatial relationships make it hard to understand geometry, align columns of	- Consistent expectations and routines in each maths lesson - Progression of skills as set out in SoL followed to ensure that prior knowledge is built upon - Small, 'chunked' tasks - Regular opportunities to revisit prior knowledge - Scaffolded activities for those not working at age-related expectations and on Formative Footprints - Concrete, pictorial, abstract approach enabling students to	- Understanding challenging and abstract vocabulary. - Understanding the order to complete the tasks. - Understanding word problems and identifying key vocabulary or instructions 'hidden' within problems - Social communication needs (e.g., autism spectrum conditions)	- Widgit-supported vocabulary to clarify key terms and concepts - Pre-teaching of vocabulary and sentence structures - Use of sentence stems and rehearsed language - Modelling of activities on class IWB

numbers, or use number lines accurately.			
Physical and Sensory		Social, Emotional and Mental Health	
Subject Concerns for SEND	Provision for SEND	Subject Concerns for SEND	Provision for SEND
- Struggling with soundscapes used which may be too noisy. - Different pencil grips given to support how pencils are held. - Difficulties using manipulatives	- Headphones given if sound is needed for the task/ used where appropriate. - iPads or laptops as an alternative to handwriting where possible - Sloped boards, pencil grips, or adapted pens - Enlarged print, coloured overlays, or Widgit symbols for visual clarity - Reduced writing load with focus on quality over quantity - Storyboards to allow pupils to plan visually before writing - Differentiated recording methods (typing, dictation, drawing + labels, drawing, taking pictures of practical activities	- Low self-esteem or fear of failure - Anxiety around maths tasks - Difficulty sustaining attention or managing frustration - Feeling that they are not 'good' at maths	- Varied types of question - Positive reinforcement and clear success criteria - Calm, predictable routines for maths lessons - Differentiated tasks that allow success at different levels - Chunked instructions with visual reminders (e.g., Widgit symbols) - Opportunities for movement breaks