Easton Royal Academy: Maths Handbook

Key features of our Maths curriculum

We used our six curriculum drivers to guide the development of our Maths curriculum:

- **Discrete subject quality –** Maths is taught as a discrete subject and children have a maths lesson and a 20minute 'Maths on Track' (MOT) session every day. The daily lesson is where new small-step objectives are taught and the MOT session is for retrieval and consolidation of learning. Features of lessons and MOT sessions are described further down in this handbook. In order to achieve a high level of specialist maths quality, we have worked closely with a very experienced maths consultant in setting up our curriculum, training staff and reviewing the progress we are making towards our vision of excellent maths.

  Although we have 2 mixed-age classes in our school, we teach Maths in 4 different classes (EYFS, KS1, LKS2 and UKS2) in order to make the progressive steps very small for each group. This is facilitated by HLTAs. Within our 4 groups, learning objectives are further split so that each year group are following a separate pathway and have separate tasks and outcomes.

- **Memorable learning –** We have chosen our 'Can Do' curriculum approach because of it's focus on learning for mastery and memory. The features of our curriculum which focus on memorable learning are:

  - **Retrieval and interleaving.** The curriculum from year to year works as a spiral and then within each year the MOT sessions ensure that learners benefit from spaced repetition/practice as units are returned to for further practice and to build on prior knowledge.
  - **Vocabulary development** which enables all children to have the opportunity to develop broad and relevant vocabulary to support their understanding of the curriculum. Lessons are built around stem sentences or 'mantras', which aid student's reasoning and independence as well as building their personal bank of words and concepts.
  - **Small Step progression** to ensure that all children can access challenging content and the learning is equitable. The small step 'roadmap' for the unit is displayed on the classroom working wall and can also be requested from the school office.

- **Self-regulated learning -** All learners need to believe they can succeed and also believe that their teachers, and parents, believe they can succeed. Adopting a growth mind set is at the heart of a 'Can Do Maths' approach including the use of 'yet' and knowing that making mistakes is an essential part of learning.'

  We use routine, working walls, small-steps, manipulatives, models and images to help children to develop independence and our focus on the language of 'challenge zone' and the skills of epic learning help to set out the attitudes that make a great mathematician.

- **Equality, diversity and social justice –** The emphasis on vocabulary and explanation in our Maths curriculum has been designed to close language gaps among our students and to help them to develop

important oracy skills through a maths lens. We know that having the right language structures and vocabulary can also aid thinking and so we aim to make the language explicit and taught directly in order to give students equal access to thinking like a mathematician.

- **Belief and investment in children –** We aim to develop the children's procedural fluency, while enabling children to reason and problem solve within their curriculum.

  We operate a keep up, not catch up mentality and approach using Maths on Track (MOT) sessions, purposeful scaffolding and feedback during lessons.

  We aim to achieve success in mathematics for every child by developing a 'can do' mindset, where positive attitudes and consistent effort are encouraged and rewarded.

  We have invested in really high-quality and engaging maths manipulatives and software that students can use to aid thinking in lessons.

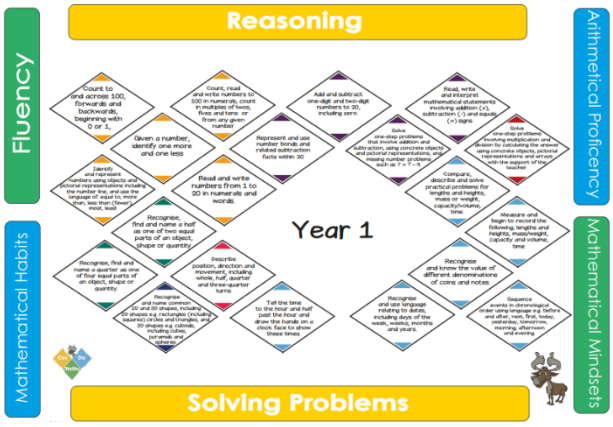
- **Celebration of our local area and people –** We use our local area to bring maths to life wherever possible. This includes use of equipment in our school science garden (digital weather station, thermometers, rain gauges and other means to collect and use real life local data).

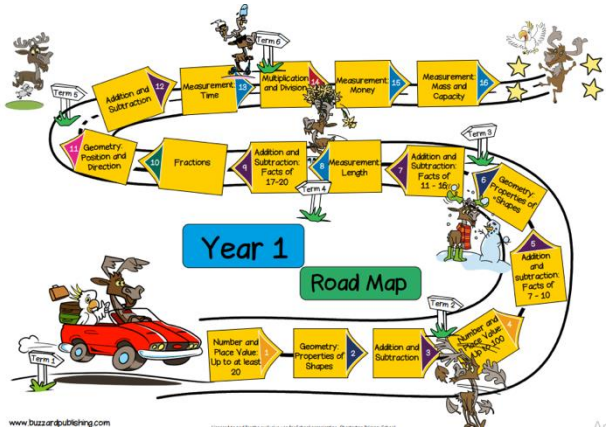
Curriculum Design

From Years one to six, our curriculum is driven by the 2014 National Curriculum for mathematics, the aims of this are to ensure all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Our curriculum is carefully structured to ensure progression year on year. There is a strong focus on number at the beginning of each new year, so that there is time to secure this throughout the next 12 months.





Early Years

We have worked closely with our maths consultant to begin to develop a progressive maths programme for our Early Years.

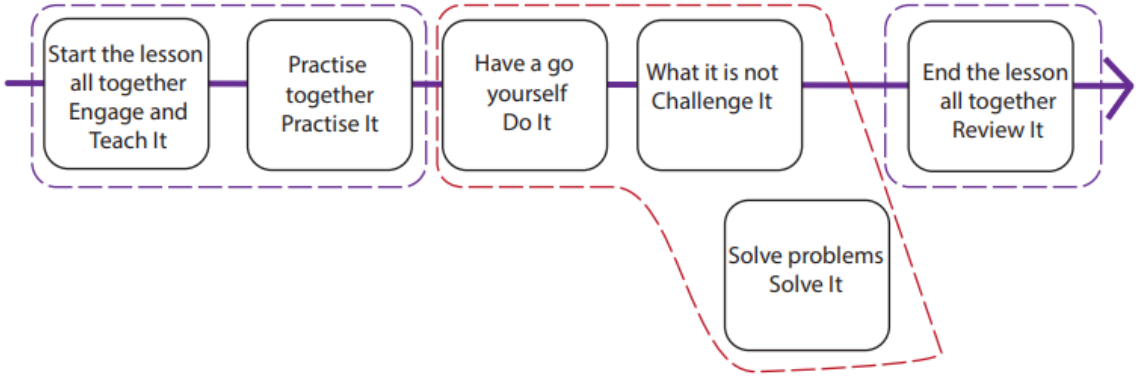
In Early Years, medium term plans identify small key learning points creating manageable steps for number. Teaching sessions are based on 'what it is also' and 'what it is not', putting a spotlight on misconceptions to secure learning. Adult led groups, focus on the manageable step to assess and challenge the children's understanding. Continuous provision is planned to provide opportunities to secure learning and solve problems within the teaching. There are also additional opportunities to explore learning within spatial reasoning and patterns and relationships across the year.

Key Stage 1 and 2

Within Years 1-6, medium term plans identify small key learning points creating manageable steps. Independent activities and questions are designed using ***Variation Theory*** *(**Do It**: what it is/what it is also; **Challenge It**: what it is not; **Solve It**: challenges to apply learning).*

Learning focuses on developing conceptual understanding, and practising gives all learners the chance to have a go and be successful. Concrete and pictorial representations are chosen carefully to help build procedural and conceptual knowledge together. Support and challenge is integrated into lessons and reasoning and solving problems takes place throughout the lesson. Challenge is provided by going deeper rather than accelerating too early into new mathematical content.

There are staff support videos for every unit of study and these recommend key models and images and how they could be used.



<u>Typical features of a Maths lesson</u>

Engage: An anchor task/hook is frequently used to engage the pupils in their learning. Pupils are given time to explore or discuss.

Teach It: Concrete and pictorial representations are chosen carefully to help build procedural and conceptual knowledge together.

Practise it: Children practise their new learning (and methods) with support as needed from a peer or adult.

Do It: Children have a go and a few straightforward examples independently, including what it is and What it is also.

Challenge It: 'What it is not' (a key misconception) is used to secure understanding of what the learning is. Children have a go independently and a class discussion explores it further.

All pupils are expected to develop at least a secure understanding of each small key learning point.

Solve It: opportunities to solve problems applying the key learning.

Review It: an assessment of key learning

Pupils difficulties and misconceptions are identified throughout the lesson through immediate assessment for learning and addressed with intervention within the lesson or the same day or week.

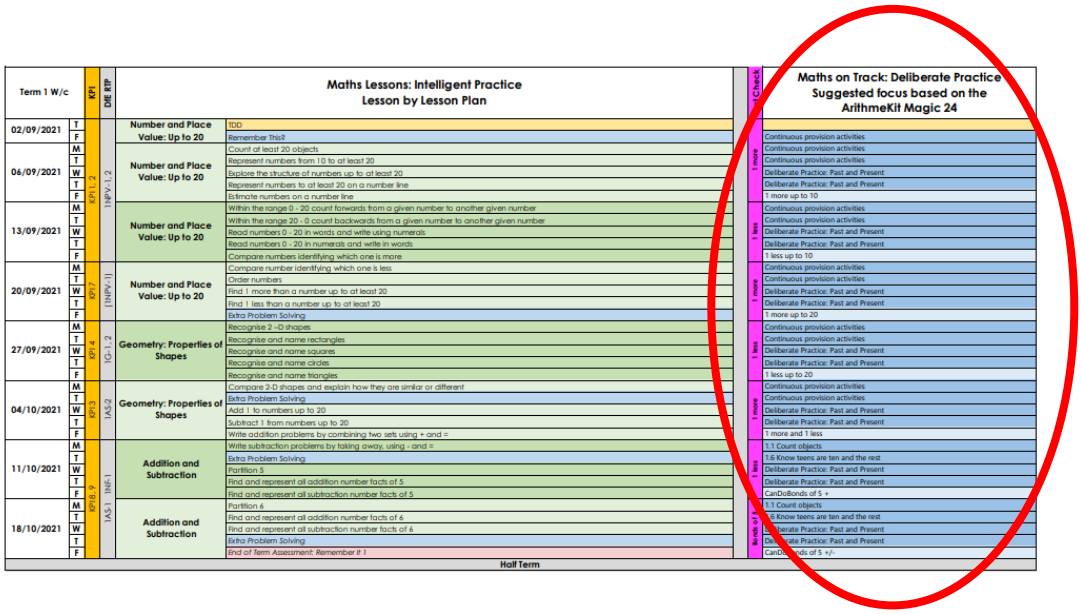
Link to a sample lesson plan

Typical Features of a Maths on Track (MOT) Session

MOT is a 20 minute daily session that is crucial in securing sustained progress. The session is used to be flexible and efficient arithmetic toolkit, practice and apply the week's learning, provide opportunities for immediate intervention and for solving problems. Accurate assessment of learning will inform decisions about the content of the MOT sessions.

A MOT session may include:

- Consolidating and practice so that children commit learning to their long-term memory to ensure it becomes deeply embedded
- Securing appropriate arithmetic skills
- Playing games to apply and practise their use of vocabulary
- Retrieval practice, focusing on learning from previous; units, terms and year groups
- A focus in on number facts and rapid and accurate recall of times tables
- The teacher working with a small group, to address identified gaps in their knowledge
- Problem solving to develop problem solving strategies



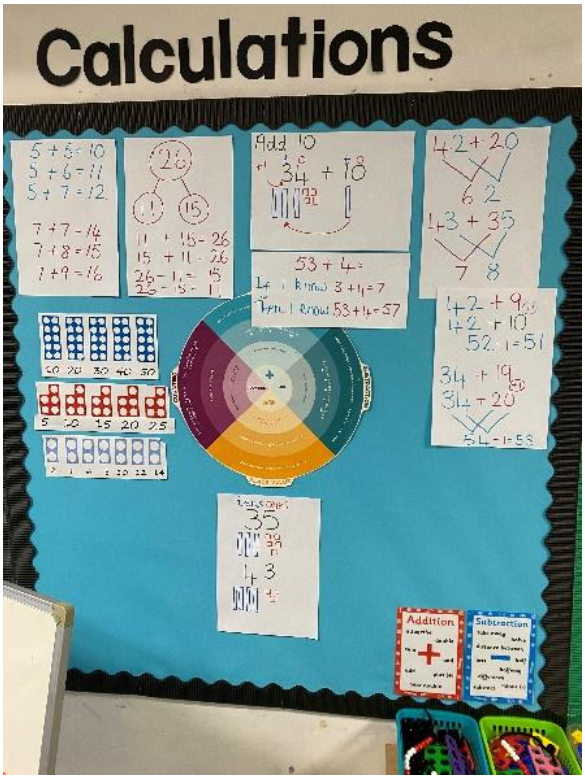
Term 1 W/c		KFI	DBE RIP	Maths Lessons: Intelligent Practice Lesson by Lesson Plan		Check	Maths on Track: Deliberate Practice Suggested focus based on the ArithmeKit Magic 24
02/09/2021	T			Number and Place Value: Up to 20	TDD		
	F				Remember This!		Continuous provision activities
06/09/2021	M			Number and Place Value: Up to 20	Count at least 20 objects	1 more	Continuous provision activities
	T				Represent numbers from 10 to at least 20		Continuous provision activities
	W				Explore the structure of numbers up to at least 20		Deliberate Practice: Past and Present
	T				Represent numbers to at least 20 on a number line		Deliberate Practice: Past and Present
	F	EP1-2	NPV-1, 2		Estimate numbers on a number line		1 more up to 10
13/09/2021	M			Number and Place Value: Up to 20	Within the range 0 - 20 count forwards from a given number to another given number	1 less	Continuous provision activities
	T				Within the range 20 - 0 count backwards from a given number to another given number		Continuous provision activities
	W				Read numbers 0 - 20 in words and write using numerals		Deliberate Practice: Past and Present
	T				Read numbers 0 - 20 in numerals and write in words		Deliberate Practice: Past and Present
	F				Compare numbers identifying which one is more		1 less up to 10
20/09/2021	M			Number and Place Value: Up to 20	Compare number identifying which one is less	1 more	Continuous provision activities
	T				Order numbers		Continuous provision activities
	W	EP-1	[NPV-1]		Find 1 more than a number up to at least 20		Deliberate Practice: Past and Present
	T				Find 1 less than a number up to at least 20		Deliberate Practice: Past and Present
	F				Extra Problem Solving		1 more up to 20
27/09/2021	M			Geometry: Properties of Shapes	Recognise 2 –D shapes	1 less	Continuous provision activities
	T				Recognise and name rectangles		Continuous provision activities
	W	EP-4	IG-1, 2		Recognise and name squares		Deliberate Practice: Past and Present
	T				Recognise and name circles		Deliberate Practice: Past and Present
	F				Recognise and name triangles		1 less up to 20
04/10/2021	M			Geometry: Properties of Shapes	Compare 2-D shapes and explain how they are similar or different	1 more	Continuous provision activities
	T				Extra Problem Solving		Continuous provision activities
	W	EP-3	IAS-2		Add 1 to numbers up to 20		Deliberate Practice: Past and Present
	T				Subtract 1 from numbers up to 20		Deliberate Practice: Past and Present
	F				Write addition problems by combining two sets using + and =		1 more and 1 less
11/10/2021	M			Addition and Subtraction	Write subtraction problems by taking away, using - and =	1 less	1.1 Count objects
	T				Extra Problem Solving		1.6 Know teens are ten and the rest
	W				Partition 5		Deliberate Practice: Past and Present
	T				Find and represent all addition number facts of 5		Deliberate Practice: Past and Present
	F	EP-5, 6	[AS-1 NM-1]		Find and represent all subtraction number facts of 5		CanDoBonds of 5 +
18/10/2021	M			Addition and Subtraction	Partition 6	Bonds of 5	1.1 Count objects
	T				Find and represent all addition number facts of 6		1.6 Know teens are ten and the rest
	W				Find and represent all subtraction number facts of 6		Deliberate Practice: Past and Present
	T				Extra Problem Solving		Deliberate Practice: Past and Present
	F				End of Term Assessment: Remember It ! !		CanDoBonds of 5 +/-
Half Term							

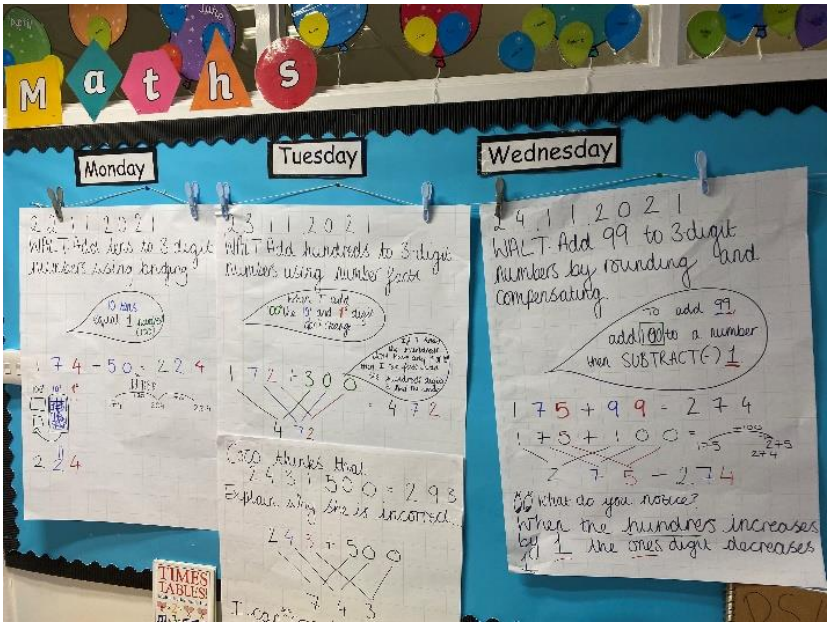
Working Walls

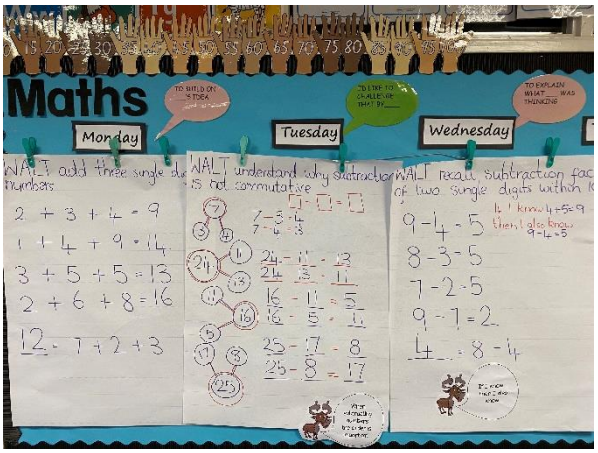
Working walls form an integral part of our teaching environment and they are a very powerful visual tool for our pupils when they are actively used and well maintained.

Each classroom needs to have 2 Maths working walls. The purpose of the working wall is for it to be a resource for the children. One display should change daily following on from the 'teach it' segment of the Maths lesson and the other builds throughout the year developing the 4 main mathematical operations which includes age-appropriate vocabulary.

Working walls should be referred to and support pupils in their independent learning.







Calculation Strategies

An appreciation of number and number operations, which enable mental calculations and written procedures to be performed efficiently, fluently and accurately is key to children being successful in mathematics.

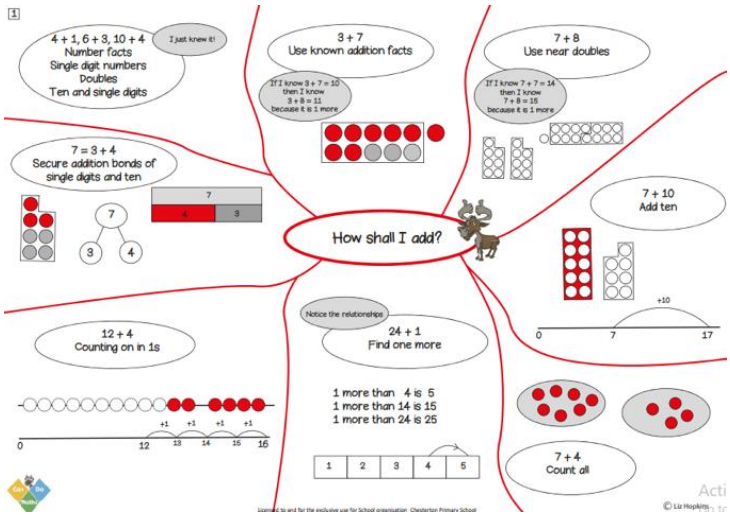
We aim for all children to be:

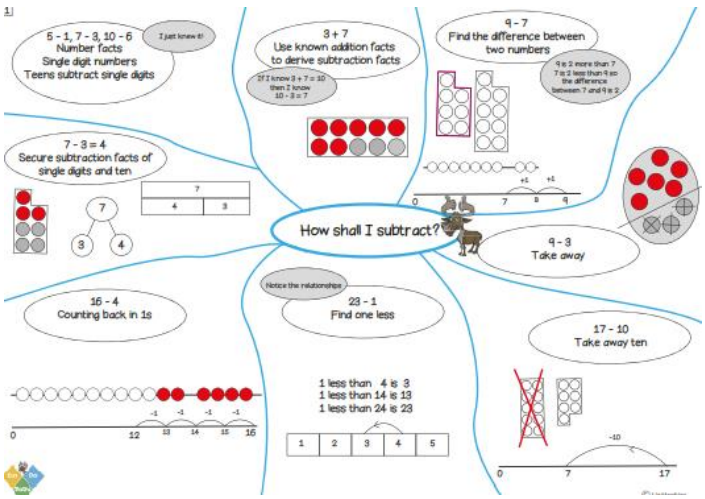
- Able to recall quickly and accurately basic number facts (e.g. number bonds, multiplication and division facts)
- Fluent in applying quick, efficient written and mental methods of calculation.

Before doing a calculation, all teachers and pupils look at a calculation and think *'What do I notice? 'and 'Can I do it in my head, with jottings or do I need to use a written method?'*

All teachers use concrete and pictorial representations to teach conceptual understanding of mental and written calculation methods. The Mathematics Curriculum prioritises time for developing conceptual understanding of calculation methods and learning facts. We therefore ensure:

- All teachers are confident and skilled to teach mental methods (in your head or with jottings) and written calculation methods
- All children have a secure understanding of mental and written methods of calculation suitable for their stage of learning.
- All children choose appropriate calculation methods depending on the numbers.
- All children can recall, understand and make connections using facts suitable for their stage of learning.





Assessment

During the lesson teachers will continually be using Assessment for Learning which informs the next steps in their teaching, and help them identify gaps in pupils knowledge which can be targeted during the MOT session.

Unit Quizzes – These can be used within a lesson for immediate feedback about the manageable step

Low Stake End of Unit Quiz – These can be used at the end of a unit to assess what the children can do, and allows the children to reflect on their own learning, which can be used to inform future MOT sessions

Remember Its – These include three types of questions, Can you do it? Can you convince me? Can you solve a problem? This is based on the term's learning

NFER Standardised tests – We have a formal Maths test 3 times a year with a standardised result from the NFER. This gives students much-needed experience of formal tests in order to reduce their cognitive load when the time comes for SATs and also to give them confidence in their own capabilities to express their learning in this way. Additionally, it gives us a good national benchmark which helps us to judge how we are getting on and any interventions or changes that need to be put in place to improve.

Feedback

As we aim to achieve success in mathematics for every child, the 'Do it' part of the independent work is marked in **GREEN PEN** (during the lessons as much as possible – see feedback policy) and should ensure that all children are successful.

Wherever possible, verbal feedback is used to support children in understanding their next steps, challenge the children's thinking, and to develop and deepen their understanding.

Students are required to actively improve their work and make corrections where necessary and teachers highlight areas for active improvement/correction/editing in **ORANGE HIGHLIGHTER.**

Student edits are written in **PURPLE.**

Staff Continued Professional Development

Within the CanDoMaths approach, there are online subject expertise videos for every unit of maths, to support teachers in understanding and developing their instruction, with clear subject specific vocabulary and appropriate models and visual representations to use. There are also live planning clinics every Thursday for further professional development within the mastery approach.

There has been continued work alongside a maths consultant to ensure that our maths curriculum is fit for purpose and is matched to our children's needs.

There is also ongoing in school support to develop and evaluate the individual needs of teachers in order to achieve the subject aims within maths.