Mathematics Policy

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Introduction

This document sets out to identify the provision that Ridgeway Primary School ensures for the planning, delivery, assessment and monitoring of Mathematics.

Intent

Vision & Aims

We want our children to experience more than what is offered through the National Curriculum. Life in the wider world demands so much more and we aim to ensure all our children have the knowledge and skills to succeed in life through the experiences we provide so that they can all be STARS!

Our vision is that all children, who attend Ridgeway Primary School, should enjoy and succeed in mathematics, regardless of background because mathematics is essential to everyday life as it is a foundation for understanding the world. By providing the ability to reason mathematically will offer a sense of enjoyment and curiosity about the subject.

Curriculum Drivers

We give children opportunities to be imaginative, to use experiences and observations to make connections in their learning and appreciate that learning can be accomplished in different forms. To do this, we have established some key 'curriculum drivers' which outline our aspirations for our children by the time they leave us (Expre**S**sive Communicators, Heal**t**hy Champions, Life Long le**a**rners, Wo**r**ld Citizens and Open to po**S**sibilities). Our 'curriculum drivers' are designed to enable our pupils to 'Reach for the Stars' through their learning. We aim for our children to grow both academically and socially and our curriculum has been created to achieve these aspirations for all.

Expre**S**sive Communicators - Our curriculum encourages pupils to talk in all areas of learning; communicating their ideas in a range of different and imaginative ways, so they are able to communicate effectively with confidence and enthusiasm.

Heal**t**hy Champions - It is important to us that all members of our school community are healthy - physically and mentally. Throughout life, our children will face many difficult challenges and need to have the mental and physical strength to be successful and happy.

Life Long le**a**rners -Learning at Ridgeway is promoted in a fun and exciting way. The four R's of our Growth Mindset philosophy of being resilient, resourceful, reciprocal and reflective at school and beyond cannot be underestimated and our curriculum reflects this.

Wo**r**ld Citizens — Our curriculum enables our children to develop an understanding about their local community where they live and the wider world, by providing opportunities for learning within and beyond the classroom.

Open to po**S**sibilities — Children cannot aspire to things that they have never encountered. Our curriculum opens their eyes to new possibilities so they can develop aspirational attitudes and understand how to achieve their full potential.

Implementation

Organisation of the Curriculum

'Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.' (National curriculum 2013)

We believe the 'mastery approach' to teaching maths is the underlying principle of mastering Mathematics. Instead of learning mathematical procedures by rote, we want pupils to build a deep conceptual understanding of concepts which will enable them to apply their learning in different situations. At Ridgeway, we follow the Mathematics Mastery programme where the curriculum is cumulative - each school year begins with a focus on the concepts and skills that have the most connections, which are then applied and connected throughout the school year to consolidate learning. This gives pupils the opportunity to 'master maths'; by using previous learning throughout the school year, they are able to develop mathematical fluency and conceptual understanding. To avoid teaching procedures we encourage pupils to develop a deep understanding in mathematics through 3 key principles;

1. **Conceptual understanding**

'Deep understanding' in maths is being able to represent ideas in many different ways using objects and pictures to represent abstract concepts. Mathematics Mastery use the Concrete-Pictorial-Abstract (CPA) approach in order for pupils to develop a deep understanding. Reinforcement of learning is achieved by going back and forth between these representations, building pupils' conceptual understanding instead of an 'instrumental understanding'.

- Concrete - the doing: A pupil is first introduced to an idea or a skill by acting it out with real objects. This is a 'hands on' component using real objects and it is the foundation for conceptual understanding. Concrete refers to objects such as base ten blocks, fraction tiles, markers, or other objects that can be physically manipulated.

- Pictorial - the seeing: When a pupil has sufficiently understood the hands-on experiences performed, they can now relate them to pictorial representations, such as a diagram or picture of the problem.

•Abstract - the symbolic: A pupil is now capable of representing problems by using mathematical notation, for example: 12 ÷ 2 = 6. This is the most formal stage of mathematical understanding. Abstract representations can simply be an efficient way of recording the maths, without being the actual maths. We believe the meaning of symbols must be firmly rooted in experiences with real objects; otherwise it becomes rote repetition of meaningless memorised procedures.

2**. Language and communication**

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others. (National Curriculum 2013) We believe that pupils should be encouraged to use mathematical language and full sentences throughout their maths learning to deepen their understanding of concepts. The way pupils speak and write about mathematics has been shown to have an impact on their success in mathematics (Morgan, 1995; Gergen, 1995). We therefore staff should use carefully sequenced, structured approach to introducing and reinforcing mathematical vocabulary throughout maths lessons, so pupils have the opportunity to work with word problems from the beginning of their learning. Every Mathematics Mastery lesson provides opportunities for pupils to communicate and develop mathematical language through:

•Sharing the key vocabulary at the beginning of every lesson in the Do Now section, and insisting on its use throughout;

•Modelling clear sentence structures and expecting pupils to respond using a full sentence;

•Talk Task activities, allowing pupils to discuss their thinking and reasoning of the concepts being presented;
•Plenaries which give a further opportunity to assess understanding through pupil explanations.

Pupils should revisit mathematical language from previous years and explore the concepts in greater depth. There should be opportunities for pupils to clarify vocabulary and explore activities that develop an understanding of the different concepts.

3. **Mathematical thinking**

We believe it is essential for pupils to develop mathematical thinking in and out of the classroom in order to fully master mathematical concepts. We want children to think like mathematicians, not just DO the maths. We believe that pupils should:

•Explore, wonder, question and conjecture,

•Compare, classify, sort,

•Experiment, play with possibilities, vary an aspect and see what happens,

•Make theories and predictions and act purposefully to see what happens, generalise.

It is important that we support all pupils in developing their mathematical thinking, both in order to improve the way in which they learn, as well as the learning itself. Good questioning should be used to develop pupils' ability to compare, modify and generalise, all building a deeper understanding of mathematics. Problem solving 'Pupils 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.' (National Curriculum 2013)

Problem solving

The Mathematics Mastery Programme places problem solving is at the heart of the curriculum as the essence of everything we do as mathematicians. Problem solving should not be an add-on at the end of a maths lesson or a weekly investigation lesson. We believe that a problem-solving approach is the key to mathematical success, and

should be used continually throughout lessons to build on depth of understanding. Pupils should be given every opportunity to explore, recognise patterns, hypothesise and be empowered to let problem solving take them on new and unfamiliar journeys. Even the most straight-forward of tasks can be an opportunity for pupils to investigate, seek solutions, make new discoveries and reason about their findings.

Curriculum Progression

At Ridgeway, we follow the Mathematics Mastery resourced curriculum which has been created following the guidance set out in the Mathematics National Curriculum using curriculum maps, programmes of study and key representations for each year group - it ensures that progression is catered for as children move through the Primary Phase. The units systematically build upon children's prior knowledge, developing their understanding of each Mathematical concept and the links that can be made.

Ridgeway's Progression and Vocabulary Documents have also been created, which are used in conjunction with the Mathemtics Mastery Resourced curriculum. The documents feature each threshold concepts (Mathematical overarching concepts) and the key mathematical vocabulary that should be taught. Under the threshold concepts, the document follows a progression of skills which have been matched to each year group's unit. The majority of threshold concepts are taught in all year groups; this allows pupils to revisit the topic, recap prior learning and then deepen their understanding. The *Progression in Calculation* document outlines the key skills and the different calculation strategies that should be taught and used in Years 1 to 6 in line with requirements of the Primary National Curriculum .The Calculation Policy is intended to be embedded as Mathematics Mastery programme is rolled out year on year to each cohort of pupils.

Planning and Teaching

At Ridgeway each year group teaches at least 4 Maths lessons per week (lasting between 1hour – 1hour 15min). In addition to this, teachers deliver a times tables session each week (approx. 30min) in Year 2 and above. All pupils in Year 2 and above also complete daily times table practice.

Teachers follow a 6 part lesson structure although teachers have the flexibly to adapt this to suit the needs of the children as long as the three key principle of language and communication, conceptual understanding and Mathematical thinking are incorporated.

1. **Do Now Task**
The purpose of the 'Do Now' task is to consolidate previous learning. This could be recapping on what was learnt the day before or a topic from a previous unit that is necessary for the current lesson. Do Now tasks can be independent work that the children do about 5 minutes or a guided task with an adult to clarify misconceptions.

2. **New Learning**
The New Learning section introduces the main learning for the lesson, beginning by sharing the lesson's key vocabulary (Star Words). It is expected that this segment will require clear explanations and modelling. The New Learning section usually lasts around 15 minutes, and may involve partner discussions and answering questions, so

teachers can check pupils' understanding before moving onto the next parts of the lesson. If children are at different starting points for the lesson a TA may be used to differentiate the new learning.

3. **Talk Task**
As language is such an important feature of Mathematics Mastery, Talk Tasks are imperative. This segment allows talking about maths and comprehension to be developed, and provides opportunities to use mathematical language. The main focus here is on the children working together in pairs or small groups and talking in full sentences about maths. Developing pupils' language is an important feature of the Mathematics Mastery approach, and taking turns and listening are important to children's development. Pupils will need training in how Talk Tasks will look. Ensure that you are always using the correct language structures when modelling questions and responses, and insist that pupils respond fully at all times when they are replicating your language use. Assessment of understanding should take place during this segment by listening to pupils' explanations and discussions.

4. **Develop Learning**
The Develop Learning segment should mirror the New Learning earlier in the lesson, but aims to move the pupils' learning on further and deepen their understanding. Learning could be developed by introducing different resources, adding a problem solving element, or encouraging further good language use following the Talk Task. This is a great opportunity to assess progress and understanding, and deal with any common misconceptions before pupils start independent work.

5. **Independent Task**
This segment should give pupils the opportunity to practise their Develop Learning by working independently and demonstrating what they have understood and learnt. Although this is an independent task, this does not mean that the children must work alone, in silence, as they should be encouraged to discuss mathematical concepts together using the key vocabulary of the lesson. Here, tasks will often need to be adapted so they challenge everyone in the class. Teachers will need to consider how they can deepen mathematical thinking for those pupils who have accessed the learning with ease. Whilst the pupils are working independently, teachers should assess progress to pick up on any pupils that are struggling, or need additional challenge and to direct how the plenary will be used.

6. **Plenary**
The final part of the lesson should be used to reflect on learning, gather evidence for assessments and plan for future learning. It should sum up what the children have learnt during the lesson, consolidating all learning, address any common misconceptions, and may pose a question for the next lesson.

Transitions
Transitions are times when pupils move from place to place or activity to activity. Pupils spend a lot of time in transitions – by necessity – and when they are in transitions they are always learning. As every second counts in a Mathematics Mastery lesson, transition activities are a very important component. Between tasks, children sing songs or do call and response activities with the teacher. These activities are exciting for the pupils, and helps to keep them focused on the learning and the lesson flowing. It is imperative that the transitions are smooth, snappy and meaningful, so these will need a lot of practice initially. Although these may seem repetitive at first, this repetition will aid learning, and eventually each lesson will use a variety of transitions.

Maths Meetings
Maths Meetings are a vital part of the Mathematics Mastery programme, used to consolidate key learning for 10-15 minutes at least 3 times a week outside of the maths lesson. Maths Meetings provide an opportunity to teach and revise 'general knowledge maths' which may not explicitly be covered during the maths lesson, and also allows the daily integration of maths into the surrounding environment. This means that pupils are practicing concepts and skills on a regular basis, meaning they are continually building on their mastery of these concepts. Maths Meetings should be a positive part of the day which everyone looks forward to and pupils should be fully engaged with. Singing and chanting should form an integral part of the Maths Meetings, and should be delivered from a Maths Meeting board or flipchart as a visual structure for pupils to become familiar with. Calendar maths and place value should be included in every Maths Meeting and the rest of the meeting should change regularly according to the topics you wish to revise and consolidate. Maths Meetings are used in all year groups within your school, as it gives the teacher opportunities to reinforce and consolidate key areas of the curriculum, and also allows time to introduce topics and concepts that may be part of the next unit.

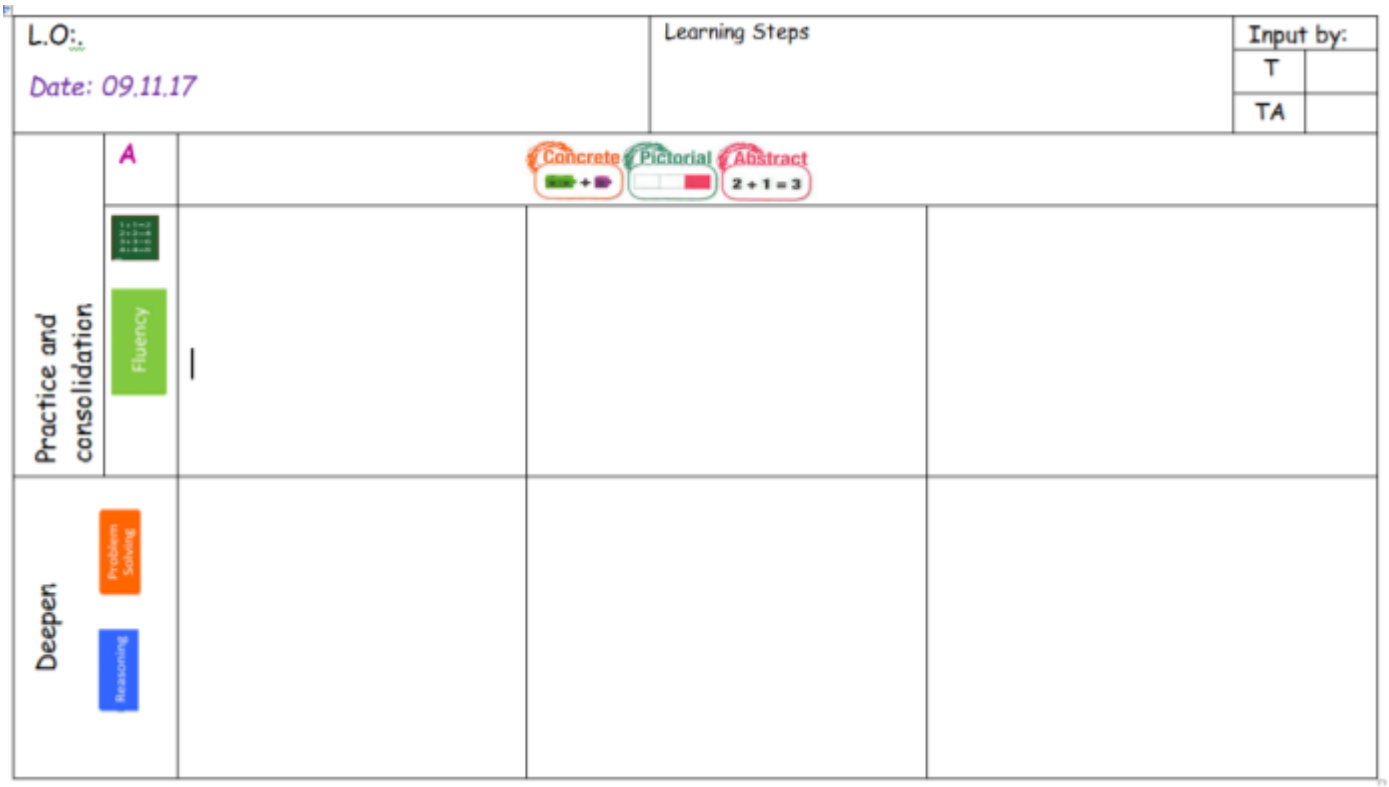
Times Tables

Times table recall has always been a vital contributor to the success of our learners. Times tables are used throughout the maths curriculum, and day-to-day life, so we ensure that the practice of such a skill is embedded throughout the school. In Year 2 and above, all children complete 5 minutes of times table practice every morning on a times table that has been set by their teacher. In addition to this, times tables are taught through songs and chants during transition times and through game-based activities. Teachers will also allocate a 15-30 minute slot in which the class will have opportunities to practice their times tables through a range of activities and access Times Table Rock Stars. This is a program that the school have a subscription for which can be accessed by all pupils at school and at home. We feel this is essential in preparation for KS2 and beyond as it is used throughout the curricilum.

In Year 4, children complete the statutory Multiplication Check in June. The MTC does not have a pass mark. The results from this assessment is analysed and can be used to inform further teaching of times tables in Year 5 and 6. The above statement is in addition to the further teaching of times tables through the Maths Mastery curriculum.

Planning

In KS2 each child at the beginning of the lesson will stick in the template below showing the learning objectives and learning steps for the lesson. The activities for the lesson are listed in the boxes below the learning objective/steps. Activities should be differentiated/adapted in the columns left to right. ALL pupils should have the opportunity to reason and problem solving before moving onto the next column.



In KS1 pupils stick in the below template at the beginning of their work each day which shows the learning objectives for the lesson.

Inclusion

'The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on (National Curriculum, 2013)

We stick by the idea that differentiation should not be through accelerating through the curriculum or task modification in the traditional sense but that differentiation should be carefully planned and come from the three principles of Mathematics Mastery (see above) pupils should be encouraged to explore and investigate topics in greater depth, so they build a stronger understanding of the main maths concepts within that topic.

We believe that in order to make differentiation successful, teachers should adapt tasks to suit the needs of their pupils. Differentiation should be built into the lesson resources by the teacher, as they know their pupils' progress and understanding best. Some children will have gaps in their learning especially in upper KS2 and differentiation will need to take account of this. Some children will need to build up to the main objective for the lesson by initially working through the 'learning steps' which may come from previous year groups. In order to successfully engage with the Mathematics Mastery programme resources and provide appropriate support and challenge for all of your pupils, it is essential that staff adapt and differentiate. Differentiation should involve the adaptation of tasks and learning opportunities so that all pupils can access the same principle.

Scaffolding and constraints, 'intelligent' task design and rich Low Threshold High Ceiling tasks will ensure that every child succeeds in mathematics. Special Educational Needs Children with SEN are taught within the daily mathematics lesson and are encouraged to take part when and where possible through differentiation meeting the needs from their IEP's. In some instances this may mean personalised activities and learning. When additional support staff are available to support groups or individual children they work collaboratively with the class teacher and feedback information on progress throughout the lesson.

Ideas for depth

This is a tool to help teachers differentiate and challenge pupils to develop a mathematical thinking and reasoning within a concept. Each of the ten ideas are represented by a picture or symbol, meaning after introduction, the tasks can be easily identified by pupils without the need for written instruction. (See teaching and learning handbook).

Questioning

Questioning plays a crucial role in developing mathematical thinking, by helping students to identify thinking processes, making connections between ideas and building new understanding. It is important that staff adapt the Mathematics Mastery Lesson Guides to include their own questioning based on the

needs of their pupils. It is really important to model good questions and answers in lessons. Pupils should be encouraged to speak in full, correct sentences and should be prepared to explain and justify answers when prompted. When Pupils struggle with this it can be tempting to think or say "I know what you're trying to say…" and to move on, but this is not encouraged. Pupils should be pushed to explain themselves with clarity and precision as much as possible. Questioning is a useful way of engaging, supporting and challenging students. In this context, good questions would prompt new thinking, probe understanding and promote discussion, pushing students outside of their comfort zone. Rather than accepting a given answer, teachers can always probe further by asking 'how' and 'why' questions. Open questions can be used to elicit responses from students that move beyond simply carrying out a calculation or procedure. Using open questions allows students to develop their thinking and problem solving skills and allows the teacher to make a more informed judgement about current understanding and misconceptions

Cross-curricular opportunities

Holistic teaching is especially important to the planning and delivery of our curriculum as it supports the viewpoint in which children see the world. Where links to other subjects can be made, they should be; however, teachers make explicit links to our learning characters to ensure children have a sound knowledge of the subject that is being taught as well as the learning objective that is being covered.

At Ridgeway we believe that mathematics lessons should be interactive, fast-paced and fun – with all pupils fully engaged therefore we understand the importance of creative freedom when planning lessons. Where links can be made with other areas of the curriculum to enrich experience for pupils they should be.

Resources

All teachers should organise an area within the classroom/year group dedicated to mathematics resources. This area is easily accessible to all children and allows them to become familiar with all resources. For all year groups mathematics Mastery resources have been purchased - enough for each pupil in the class and should be used to support conceptual understanding.

Impact

Assessment & Recording

Daily assessment for learning takes places and children are given immediate verbal or written feedback in line with our marking policy. Staff should record Assessment for learning notes within their Assessment for learning profiles. Where children need additional support and intervention, in order to gain a better understanding of their learning, children will take part in small group or individual Fast Forward intervention sessions. This is monitored and reviewed regularly to ensure that children of all abilities and needs have been catered for.

Intervention

Intervention is based on teacher assessment during the daily maths lesson. Teachers will identify pupils who have not fully grasped the lesson content. These pupils receive targeted intervention, ideally as soon as possible and delivered by the teacher or teaching assistant. Teachers have allocated 'Fast Forward' slots to enable pupils to keep up. These sessions can also be used to pre-teach learning which some learns may find tricky. This should be done in

addition to the mathematics lesson so pupils do not miss out on the learning taking place in the lessons. Do Now tasks can also be planned in to address misconceptions

Assessment

Class teachers complete key construct grids for between 8 -12 children (dependent on experience) to ensure evidence is collected against key objectives. Key Constructs are some of the 'big ideas' in mathematics that are essential to understand to enable progress in the subject (these are linked to the ready to progress statements). These are the foci of our assessment teacher assessments. Staff should keep a record of evidence of these and this should be available when moderation takes place. A range of evidence should be supplied, such as evidence from classwork, standardised tests, pre and post assessments and Do Now tasks. Teachers should ensure that that evidence dated if fully independent

The key constructs are then used to inform teacher assessment at the end of the year identifying which children are working below, at expected or above the expected standard. Senior leaders use this assessment framework to identify areas for development and strengths within the class, cohort and school to inform the school improvement planning and development.

Termly pupil progress meetings with senior leaders ensure that class teachers are using the assessment in order to best support the needs of the children in their class.

Teachers in Y3,4,5 will also carry out a NFER assessment once a year and Pupils in Y2 and 6 will sit the end of year SATs tests.

Pupils Self-Assessment and Review

At Ridgeway, we believe that engaging pupils in their learning is essential. To do this we have introduced Learning Conversations, with increasing sophistication as pupils move up through the school. Pupils are encouraged to reflect on what they have learnt as well as their behaviour for learning and to set themselves targets. MyLOs also enable pupils in KS2 to see their learning as a journey.

Pre and Post Assessments

The idea of Mathematics Mastery is keep up not catch up therefore pre and post assessments have been introduced across the school. Staff carry out pre assessments before the unit is taught to establish starting points for lesson planning based of prerequisite knowledge. Post assessments will include questions from the unit just taught in order to demonstrate pupil understanding. Teachers use knowledge from pre and post assessments to adapt teaching and implement pre teaching or intervention

Reporting

In order to allow parents to be informed about children's accomplishments in Maths, staff complete an end of year report, outlining the progress that has been made by the individual, their strengths and areas for development as well as the standard they are currently working. In addition, parents' evenings are used to inform and discuss with parents children's achievements, successes in writing and their standards of work. If appropriate, staff use an evidence app to upload a portfolio of pupils' work throughout the year.

The role of the co-ordinator

The maths co-ordinator is released regularly in order to work alongside teachers and SLT. This time is used to monitor and evaluate the quality and standards of mathematics throughout the school (in line with the school improvement plan) and enables them to support teachers in their own classrooms. The coordinator should carry out book scans and planning trawls to monitor standards. They should also hold regular

interviews with pupils (pupil voice) to gather information about their experiences of teaching and learning at Ridgeway.

CPD has been and is constantly being delivered to all staff. This ensures that teachers are well-equipped with the relevant subject knowledge needed to teach children of all abilities and keeps their knowledge of the requirements of the subjects up-to-date.

Rigorous CPD opportunities are planned to support all staff and, in particular, those new to the school or new to the year group. Regular meetings are held to review the impact of this support and are used to inform the next steps in the CPD programme.

The coordinator regularly attends Maths updates with Maths advisors to keep abreast of current developments in the subject. This is then disseminated to relevant members of staff and the impact is monitored.

Exemplification documents and moderation guidance is used to carry out regular moderation of standards within year groups, which is led by the coordinator. This is an opportunity for staff to reflect upon the progress within year groups and to ascertain consistent standards across a year group and phase.

Regular meetings with our link governor and curriculum governors take place to keep all relevant governors up-to-date with developments in the subject.

Additional Considerations

Prevent statement

At Ridgeway Primary School we aim to prepare our students to become good citizens of the future. Through our curriculum we teach pupils British values and how to celebrate diversity. We aim to raise their awareness of radicalisation and extremist views, whatever the source. We have adopted the principles and advice found in 'Keeping Children Safe in Education 2016' and the 2011 'Prevent Strategy'. These are incorporated into our school policy on tackling extremism. For more information please read the School Policy on Preventing Extremism and Radicalisation

Subject specific additional considerations

See teaching and learning handbook

Document History:

Maths Lead	Gemma Middleton November 2021
Maths Lead	Jake Cooper January 2023

This policy is due for renewal in January 2025