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**Burraton Community Primary School**

**Mathematics Policy**

**Foreword**

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is something which is integral to all aspects of life from dealing with money and budgeting to making accurate measurements in cooking or even knowing how much medication to take, mathematics is essential for pupils to be successful in the future. It is therefore vital that pupils

develop a healthy and enthusiastic attitude towards Mathematics that will stay with them to encourage positive wellbeing and life-skills. The National Curriculum order for Mathematics describes what must be taught in each key stage. Trekenner Community School follows the Mathematical programme of study 2014 which provides detailed guidance for the implementation of the National Curriculum for Mathematics. This ensures continuity and progression in the teaching of Mathematics.

**Intent**

At Trekenner C.P. School, we believe Maths to be a fun and exciting learning opportunity which provides a source of enquiry, fascination, challenge, and enjoyment to all children, regardless of ability. Furthermore, we believe that all children should master the curriculum; so, teaching for mastery is what we strive to achieve. We aim to provide meaningful, purposeful, contextualised application of mathematical skills whereby children are enabled to make links to real life situations and problems preparing them for their future within the local and global community and equipping them with the skills to live successful and fulfilling lives.

Additionally, it is our aim to develop both a growth-mind-set towards Mathematics within our children and for them to be able to communicate effectively about their mathematical learning. We endeavour to provide learning experiences, which both develop confidence and competence in mathematical knowledge, concepts, and skills and also the ability to solve problems, to reason, to think logically and to work systematically and accurately. For many adults, mathematics is often a source of embarrassment or anxiety which acts as a barrier to many things in the adult world. By facilitating a growth mindset, competence, and confidence we aim to ensure that our pupils never experience this and that they can take on future challenges with resilience and confidence opening up a wider range of opportunities in their futures.

When children leave Trekenner, we aim for them to have the skills of self-discipline and confidence to be a success in Mathematics. We intend to lay the foundations for successful lives after school and for the jobs of tomorrow, which will require great levels of mathematical skills and an ability to think in depth mathematically to use technology that may not even exist yet.

**Implementation**

We believe that in order for mathematics learning to be effective, it should be broken down into small steps allowing pupils to develop fluency, deepen their learning through reasoning and apply it to real life situations. We follow the white-rose small steps to achieve this. Each unit is broken down in a series of steps which informs planning and ensures pupils have a secure foundation in key skills such as.

* Understanding number systems and the size and relationships between different numbers.
* Knowing by heart number facts such as number bonds, multiplication tables, doubles and halves
* Having a secure understanding of the four operations and an ability to apply this in different complex
* using what they know by heart to solve more complex equations, problems and reasoning challenges.
* calculating accurately and efficiently, both mentally and written
* drawing on a range of calculation strategies
* making sense of number problems, including real life problems, and recognise the operations needed to solve them
* discussing and explain their methods and reasoning using correct mathematical terms - judge whether their answers are reasonable and have strategies for checking them - where necessary suggest suitable units for measuring and make sensible estimates of measurements explain and make predictions from the numbers in graphs, diagrams, charts and tables
* developing spatial awareness and an understanding of the properties of 2D and 3D shapes

Pupils are provided with a variety of opportunities to develop and extend their mathematical skills in and across each phase of education. Lessons follow a do, deepen, apply approach which enables children to develop confidence in using and applying mathematical concepts in different situations.

The teaching of Mathematics at Trekenner Community School provides opportunities for: group learning, adult guided groups, paired learning, whole class teaching and individual learning. Pupils engage in: the development of mental strategies using Visual Maths where appropriate, compact written methods, practical tasks, investigational learning, problem solving, mathematical discussion, consolidation of basic skills and number facts.

At Trekenner we aim to be creative, flexible and impactful. To that end, we use learning walls which are ever changing and each lesson could be used to model upon, draw key vocabulary, show multiple representations or for many other varied reasons to impact learning positively. We also have jotters for children to use during warm ups or during lessons which may be hands-on – these are looked at by teachers weekly but there is no expectation to mark or comment on these. Since implementing this we have seen an improved attitude in less confident learners who think this book is not being judged and maths anxiety is reduced. It also allows teachers to make formative assessments effectively and address any errors or misconceptions.

Concrete, Pictorial, Abstract (CPA)

The CPA approach, which has links to Bruner’s enactive, iconic, symbolic learning modes (1957), is a whole-school approach to improving the understanding and outcomes of our children.

**Concrete** Teachers think carefully about modelling examples with an appropriate concrete resource in the first instance: this could be for example dienes, counters, Cuisenaire rods etc. This concrete resource is a scaffold that builds number-sense and conceptual understanding of the problem. It can also aid in addressing misconceptions and improving the use of correct vocabulary. Children will have access to the resources the teacher has modelled with and use them when needed – it is important that children use the concrete resources as scaffold and after time it should be removed to allow for a pictorial or abstract method.

**Pictorial** Teachers use pictorial representations as a bridge between the concrete and abstract. For example, in place value and four operations we use visual maths as a pictorial representation of a number or problem. Furthermore, we use bar models and part, part wholes as another example of passing from concrete to abstract.

**Abstract –** Once children are secure in the concrete and pictorial forms of learning and have built their schema of thinking in a concept they move into the abstract method. The abstract method is for example, subtracting with exchanges in the column method; but, crucially, because of the concrete and pictorial steps prior – children conceptually understand what they are doing and the size of the numbers.

Depending on the point within the learning journey it may be appropriate to see only one element or all elements. This may also differ in the independent learning depending on a child’s understanding.

Lesson Organisation

1. **Input** Introduce the WALT; recap prior learning; and model key concepts with opportunities for children to practise in their jotters.
2. **Independent learning activities** Children should explore a range of activities linked to the key concept of the lesson; peel groups should be used at this point as needed to challenge/extend; activities should be a mix of varied fluency, reasoning and problem solving. Crucially, differentiation should be through depth of learning oppose to simply making the numbers bigger.
3. **A review/reflection** Reflect with the class to sort out misconceptions and identify progress, to summarise key facts and ideas and what to remember, to make links to other learning and discuss the next steps, and possibly to set home learning tasks.

Teachers use their professional judgement to determine the activities, timing and organisation of each part of the lesson to suit its objectives. There is, therefore, considerable variety and creativity on different days.

Task Structure

At Trekenner we believe children need to progress through fluency into problem solving and reasoning. To that end, we follow the ‘Do it, Deepen it, Apply it’.

**Do it –** Focuses on the pre-requisite skills and fluency that underpins a concept – moving into varied fluency and some non-standard examples.

**Deepen it –** Focuses on twisting learning and putting it within a context, this could be a reasoning or problem to solve. It would include some non-standard examples and ones which are designed to draw out any misconceptions.

**Apply it –** Focuses on using the concept that has been taught in a real-life situation which requires them to apply their learning contextually. This could form its own lesson where children use the learning of unit in a real-life, relevant context.

Progression through these stages depends on the age and stage of the pupils and where they are in the learning sequence e.g. whether of not this was the first time they had encountered the concept. We wouldn’t expect to see all three elements in a single lesson for example in a Key Stage One lesson where pupils were only just being introduced to a concept. Indeed, where appropriate it is acceptable to have a lesson which has a main focus on the ‘Do it’ fluency. Likewise, an application lesson at the end of a unit can also be a standalone where appropriate. We do, however, expect teachers to build in these three aspects within and across lessons to ensure the skills are embedded effectively.

Early Years Foundation Stage (EYFS)

At Trekenner we provide children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measure. Activities are based on practical real-life contexts to encourage inquisitive minds and develop critical thinking.

Number: children count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Shape, Space and Measure: children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

Special Educational Needs

The school aims to ensure that all pupils make progress and gain positively from each mathematics lesson. All teachers aim to:

1. Plan lessons so that all pupils can be included.
2. Use a range of resources effectively to allow access to whole class or group learning.
3. Differentiate tasks or activities.
4. Organise the class and deploy staff to support group or individual needs.

For children with a special educational need in mathematics, their targets will be included on their APDR plans. These targets will be SMART targets and will related specifically to the child’s stage of development and specific need.

Where appropriated specific techniques such as pre-teaching or intervention groups focusing on key concepts will be used to ensure pupils develop and ensure their understanding within the subject. Care will always be taken to ensure that these things do not impact on pupils access to the wider curriculum.

More Able and Talented (MAT)Children

Children, identified to have strengths in particular areas of Maths are generally taught within their class. They are taught to the same learning objective as the rest of the class when appropriate; their independent or group activity being differentiated to their needs. Progressive differentiation approaches in school ensure that there are three levels of progression for pupils to move between for both fluency and reasoning tasks. Additionally, open-ended investigations are utilized as an additional challenge for the highest ability mathematicians to ensure they are consistently challenged and engaged.

Planning and Assessment / Marking / Record Keeping

At each level of planning it is aimed that assessment informs future planning.

Long term plans for mathematics are the yearly teaching programmes set out in the White Rose scheme which is adapted from the 2014 National Curriculum.

Medium term plans are created by using the objectives from the yearly teaching programme and breaking them down into small-steps ensuring children incrementally access harder content in a progressive way to ensure progress. Medium term assessments plug gaps and help teachers to consolidate on any misconceptions or gaps.

At Trekenner we believe that the focus of planning time should be on creating the most powerful and engaging learning opportunities possible for children. Therefore, formal written planning is not required. Rather, teachers plan their learning through carefully crafted flip chart/ PowerPoints which map out the learning journey and structure the activities that the children will experience across the week. Though formal written plans are not used, teachers are expected to evaluate lessons and change/ adapt flips as required to ensure they provide the best learning opportunities for the children.

All planning is monitored on a regular basis by the Mathematics Subject Leader and the Head Teacher (these are currently the same person). We also make regular use of external consultants and the School Effectiveness Team to ensure quality assurance and ensure we are always outward facing and embracing of new ideas.

Teachers and teaching assistants make daily observations of children’s learning in order to inform future planning. Formal teacher assessments will be made on a termly basis using the school’s procedures. The subject leader is responsible for making sure judgements are moderated to ensure they are accurate. Assessments are recorded on the Insight tracker program.

Children in year 2 are tested in accordance with national standards, in the summer term. Head Start standardised assessments are administered to Years 1, 3 and 4 whilst Year 5 and 6 are assessed using KS2 SATs papers. Years 2 and 6 take SATs at the end of the year. Formal assessments are consistently used and analysed by teachers to highlight areas for development and ensure the focus of teaching is precisely targeted to the needs of children.

Further information assessment procedures is available in our school assessment policy.

Monitoring and Evaluation

In order to monitor attainment and progress the following systems are in place:

* Each teacher meets with the Headteacher six times a year to discuss progress in mathematics. Particular attention is paid to children working below age related expectations, children with SEN, children eligible for Pupil Premium and pupils who are able, gifted or talented.
* The Headteacher monitors maths through a range of activities which includes: analysis of tracking data for mathematics, lesson observations, scrutiny of books, review of planning and pupil conferencing.
* Staff meet at least three times a year to scrutinise and level mathematics across the school
* SEN children are assessed regularly by the class teacher and the SENCO. Steps are taken to provide additional support where appropriate. The SENCO and Maths Subject Leader meet regularly to discuss identified children.
* The school’s mathematics action plan is part of the whole school improvement action plan and is updated annually by the Maths Subject Leader and Headteacher.

**Impact**

We measure the impact of our Mathematics curriculum through a range of mechanisms mentioned above. We have formal quantitative outcomes through Head start assessments which enable us to carefully track children’s progress across the year. This is triangulated with a range of qualitative outcomes such as observations of our children as learners and social beings, responses from daily activities and writing outcomes, regular reviews of books, regular consideration of child voice through termly conferencing and anecdotal evidence from stakeholders.

Based on such information gathering we know that our:

* Our children enjoy their maths learning
* Our children are successful in optional summative assessments
* Our children make good progress in developing skills, attitudes and dispositions that equip them for life
* Our children are able to accurately reason and problem solve in a range of contexts.
* Our children enjoy open ended problems and attempt different strategies to answer questions.
* Our children are developing a growing understanding of various components of the maths curriculum, key skills in calculation and how to implement these for a range of purposes/contexts.
* Our children know how to be independent learners, and yet seek help when necessary

Policy Written by Marc Wheeler Headteacher and Maths Subject Leader

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Review date

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