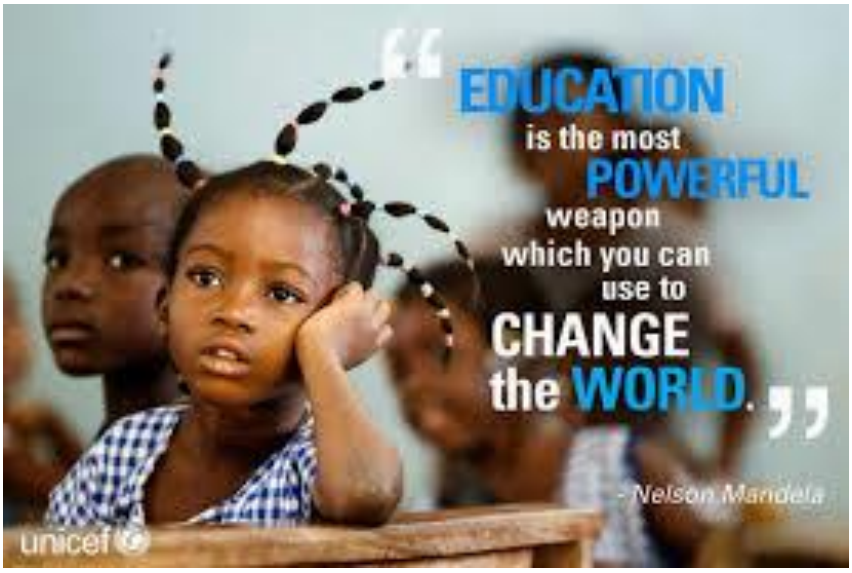
Adderley Primary School
Maths Policy
2020 - 2021

Based on the values and principles of the UN Convention on the Rights of the Child



Agreed by:	Governing Body
Review date:	December 2021

Adderley Primary School Maths Policy

Everyone at Adderley Primary School has the right to an outstanding education. As a Rights Respecting School, our Maths Policy has been developed in line with the articles in the UNCRC.

It is our aim to ensure that every child learns to the best of their ability within the rights-respecting ethos of the school.

Introduction

"A high-quality Maths education provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of Maths, and a sense of enjoyment and curiosity about the subject."

The National Curriculum for Maths aims to ensure that all pupils:

- Become fluent in the fundamentals of Maths;
- Reason mathematically;
- Can solve problems by applying their Maths.

(National Curriculum 2014)

We acknowledge that children need to learn basic number facts and acquire fluency in procedures, alongside developing conceptual understanding if they are able to solve increasingly complex problems in life and later in the workplace.

Our curriculum

Following Maths Mastery approach at Adderley, children are taught one set of mathematical concepts and the big ideas in maths. Lessons are carefully planned using White Rose maths resources to ensure that all children have access to these concepts and ideas to explore the strong connection between them. We recognise that all children need a deep understanding of the maths they are learning in order that future learning is built upon firm foundations.

These principles and features characterise our approach:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in maths.
- Maths learning is through– concrete –pictorial and abstract (CPA) approach.
- The large majority of pupil's progress through the curriculum content at the same pace.
- Differentiation is achieved by emphasising deep knowledge and through individual support, challenge and intervention.
- Teaching is underpinned by carefully chosen representations which expose the structure of the maths and plan to address difficult points in order to develop deep understanding of concepts.
- Children are taught to think mathematically and reason logically –looking for patterns and relationships.
- Communication – Precise mathematical language is used in oral/written explanations.
- A mathematically rich learning environment supports learning.
- More-able children who grasp the concept rapidly will be challenged through rich and

sophisticated problems.

- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up. The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – 'mastery' – in Maths.

Teaching and Learning

EYFS

In the Early Years mathematical needs of learners are met through working within the Foundation Stage Curriculum using Early Learning Goals. We relate the mathematical aspects of the pupil's work to the Development Matters statements and the Early Learning Goals (ELG), as set out in the EYFS profile document. Maths development involves providing pupils with opportunities to practise and improve their skills in counting numbers, calculating simple addition and subtraction problems, and to describe shapes, spaces, and measures. The profile for maths areas of learning are Number (ELG11) and shape, space and measures (ELG 12). We continually observe and assess pupils against these areas using their age-related objectives, and plan the next steps in their mathematical development through a topic-based curriculum.

In the Early Years maths lessons are taught following a Five Part Model approach and all lessons are planned and delivered following this consistently. These stages include Mental Maths in 5, Mathematical talk, Modelling, Application and Reasoning and Problem solving (RAPS). There are opportunities for pupils to do maths activities (both inside and outside)- through both planned activities and the self-selection of easily accessible quality maths resources. Pupils are just as likely to access the maths curriculum through cooking activities in the cooking area, building activities in the construction area in the outdoor area. Where ever possible, pupil's interests are used as a vehicle for delivering the curriculum. Staff will support pupil's learning through planned activities but also value and support self-initiated mathematical learning.

Towards the end of EYFS teachers aim to draw the elements of a daily Maths lesson together so that by the time pupils move into Year 1 they are familiar with features of a more structured lesson/activity.

Years 1-6

Teachers use the White Rose overviews and these include mathematical concepts covered through White Rose, NCETM's Maths Mastery and Test Base etc. These overviews are used to plan weekly lessons ensuring there are sufficient opportunities to work on an area in depth. The termly overviews show the objectives from each block which derive from the National curriculum. These are broken down into carefully planned small steps which are deigned to develop children's understanding. Each small step is broken down into fluency, reasoning and problem solving.

A Typical Lesson

<table>
<tr><th colspan="4">Five Part Maths Lesson</th></tr>
<tr><td>1</td><td colspan="2">Mental Maths Strategy

Mental Maths in 5
(5 mins – 5 times a week)

This needs to be on the flipchart</td><td>• Mental strategies to be taught are outlined on the Year Group mental maths overview. A new strategy to be taught every week.
• Monday new strategy is taught. A reminder of the strategy is to be glued into each child's book
• Tuesday -Thursday new strategy is practised by presenting a set of questions for children to work through. The questions are to be prepared on the 'Mental Maths in 5' proforma' with the strategy heading on it. Glued into books ready. The number of questions will depend on the year group. Put a timer on so that the questions are completed in 5 minutes.
• Friday- a mixture of previously taught strategies can be presented on the slip so children don't forget how to apply different strategies.
• At the end of the 5 mins the teacher will talk through the answers 'thinking the strategy aloud' so children can mark their own work. This needs to be done relatively swiftly.</td></tr>
<tr><td>2</td><td colspan="2">Mathematical talk
(5 mins)</td><td>• Language to go with the topic needs to be presented on the flip chart as well as on the learning wall. Choose 5-6 key words which you want the children to learn over the block/small step. Expect the children to be able to remember these as the week progresses.
• Also model how to use the sentence stems and answer the key questions throughout the lesson.</td></tr>
<tr><td>3</td><td rowspan="2">Varied fluency</td><td>Modelling
(10 mins)

Have concrete apparatus out as demonstrated in the White Rose Scheme of Learning
Whiteboards out ready for jottings.</td><td>• Introduce Learning intention (LI) children to write it in their books (as appropriate)
• Recap previous learning.
• Display a modelling example on the flipchart. Read it through and discuss what the question is asking us. How can we solve it?
• Model how to solve the problem with the children mirroring what you are doing with their boards/apparatus. Teach the representation which the children are going to apply. Display representation on learning wall.
• Model how to use the mathematical language and sentence stems as you solve the problem.
• Expect children to be using this language in their responses.
• If appropriate demonstrate a variation of representation.</td></tr>
<tr><td>4</td><td>Application
(10-15 mins)

Children to be working on the applications by themselves. If children need to revisit the modelling part an adult to work with them for the first question.</td><td>• To link directly with what has been modelled.
• Teachers prepare questions that mirror the modelling with appropriate levels of challenge.
• To prepare 3-4 questions.
• Ensure that children use the appropriate language/sentence stems when answering questions.</td></tr>
<tr><td colspan="4">Mini plenary as necessary to address any misconceptions.</td></tr>
</table>

5	**Reasoning and problem solving** **(10-15 mins)** **To have a Reasoning and Problem Solving (RAPS) heading in books. This could be written in and underlined or printed out for the children- as appropriate.**	• 1 reasoning or problem-solving question from the White Rose planning to be modelled with the children. • Ensure that what has been taught/learnt in the modelling/application is linked to gaining the solution. • If necessary, model the strategy if it has not been taught/mastered before • Teachers to write another reasoning or problem-solving question that is similar to what has been modelled for the children to solve by themselves. • **Don't forget that the expected responses are on the white rose planning. Ensure that children understand how to use the sentence stems and the mathematical language.** Children can underline key words if they wish.
	Plenary **(5 mins)**	• Address any misconceptions • Start to move the learning on to the next step. • Recap the vocab and model answers using the sentence stems. • Self-assessment/pupil voice- what have we learnt? What made it easier? What strategies did you use? • Pupil voice to be completed possibly once a week but definitely at the end of a block.

Classroom Environment

The learning environment in every classroom should be mathematically rich and support **current learning.** Maths Learning Walls should be interactive, clearly visible and provide the children with calculation vocabulary, key vocabulary, key questions, number lines and charts, 100 squares, number facts, prompts and challenges appropriate to the age/stage and linked to current learning. Maths dictionaries, iPad apps, and a range of concrete materials should be available for every child.

Resources

The use of Maths resources is integral to the **concrete – pictorial – abstract** approach and thus planned into our learning and teaching. We have a wide variety of good quality equipment and resources to support our learning and teaching. These resources are used by our teachers and pupils in a number of ways including:

• Each class/year group has a range of general mathematical equipment (eg: base ten, dice, tens frames, counters, counting sticks, Numicon, Cuisenaire, etc.). A wide range of additional resources are available in the maths cupboards.
• Demonstrating or modelling an idea, an operation or method of calculation, e.g: a number line; place value cards; Dienes; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; multilink cubes; clocks; protractors; dice; number and fractions' fans; individual whiteboards and pens; and 2D shapes and pattern blocks, amongst other things;
• Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required standard resources, such as number lines, multi-link cubes, Dienes, hundred squares, shapes, etc. are located within individual classrooms.

Teachers and Teaching Assistants are to ensure that resources within individual classes are accessible to all pupils who should be encouraged to be responsible for their use.

Times Tables

It is crucial that pupils develop quick recall of multiplication and that all pupils know their times tables to 12x12 by the end of the Autumn Term in Year 4. Pupils receive regular times tables practice as well as a weekly times tables tasks as homework. Pupils are tested on their times tables every week and their achievement is tracked on the 'Times Tables Record of Achievement' displayed in every classroom. Pupil's progress and achievements are celebrated in weekly assemblies and are regularly monitored by the Maths Leader to ensure all pupils are making progress.

Adderley School uses Rockstars - a web-based programme – to teach time tables through an innovative and interesting way. Parents can also get access to this programme at home which enables them to work with their child to support his/her learning. Every child and staff member has been given login details to get access to this web-based programme. There are a range of activities to raise the speed of recalling the times tables and number bonds to promote child's learning through enjoyable and competitive activities.

Mental Maths strategy

Effective mental strategies are important if children are to develop 'true' fluency. In order to develop rapid recall at Adderley we have daily Mental Maths practise through 'Mental Maths in 5'. Mental strategies to be taught are outlined on the Year Group mental maths overview. A new strategy is to be modelled and taught every week. Children will spend the first 5 minutes of each maths lesson practising appropriate calculations which ensure that they are mastering a mental maths strategy as the week progresses.

Cross Curricular Links

Maths is an integral part of our daily lives and therefore manifests itself in many areas of the curriculum. Links with ICT are continually developed through use of laptops, iPads and appropriate software. Cross curricular opportunities are used to draw mathematical experiences out of a range of activities in other subjects, such as in PE, Science and Design and Technology, to enable pupils to apply and use Maths in both real life and academic contexts. At Adderley Primary School we use a creative approach to topic work through a programme called Cornerstones. This offers many opportunities to link maths across the curriculum creatively.

Pupil support and differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. The National Curriculum states: '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.' There is often little differentiation in the content taught but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems which deepen their knowledge of the same content.

Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support. The higher attainers may be set challenges according to their level of completion and ability to provide greater depth to their understanding and learning.

Inclusion

Inclusion is about every pupil having educational needs that are special and the **s**chool meeting these diverse needs in order to ensure the active participation and progress of all pupils in their learning. Inclusive practice in maths should enable all pupils to achieve their best possible standard; whatever their ability, and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation in, or progress in their learning from starting point.

Close links with the school's SEND Leader will ensure that any specific needs requiring specialist resources are addressed promptly. Pupils with general learning difficulties will be given the opportunity to use carefully selected programmes. In Maths lessons, pupils with learning difficulties will be supported in a number of ways:

- Through targeted support by class teacher or TA;
- Through peer group support, paired with higher-achieving children or in small groups;
- Pupils with more specific needs may be withdrawn to work individually or in small groups at a classroom computer with a TA.

All relevant staff will be responsible for monitoring and recording any information relating to action plans for SEND pupils.

EAL KS2 pupils, who have no or little English, have a bespoke programme delivered by EAL Instructors and a Core Skills Curriculum.

Record Keeping/ Assessment

To develop learning, pupils are continuously assessed using a variety of strategies e.g. observation, questioning and marking in accordance with our school's Feedback Policy. Maths Books provide evidence of progress, along with annotated flipchart planning and mental calculation strategy overviews. Learning should be recorded in as many ways as possible to provide pupils with a range of experiences.

In EYFS, pupils will be assessed and the Foundation profile completed throughout the year. In KS1 and KS2 pupils are assessed as emerging, developing or secure in their learning objectives at the end of each unit of work and information is recorded onto the school's tracking system (Educater) once a term. Data is then used to inform future planning and provision, and to identify pupils for intervention and support. The class teacher, Maths Leader, SEND Leader, EAL leader and the Strategic Leadership Team keep records of assessments. Summative end-of-term/block assessments will take place using NTS and previous SATs tests and Collin's Times Table tests. These tests are in line with the expectations of the 2014 curriculum.

These will link to the learning objectives for their year group and allow pupils to understand their next steps in learning. Statutory Assessment Tasks (SATs) will be administered in accordance with the DfE at the end of KS1 and KS2.

Class teachers will be responsible for annually reporting to parents on their children's progress in maths. The Maths Leader will be responsible for monitoring these processes and addressing the training/professional development needs of staff. The Maths Leader will also be responsible for collecting, collating and analysing data in order to report standards to parents, governors and the LA as required.

Parents/Carers

The school aims to involve parents/carers in their children's learning as much as possible and provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through parent workshops. Maths Workshops for parents take place at least once a year for each class. During these workshops, parents have an opportunity to work with their children on fun, purposeful maths activities that can be extended into the home. Each workshop is planned and delivered by their children's teacher in collaboration with the maths leader. Parents/carers have the opportunity to meet with child's class teacher at least twice a year at Parents' Afternoon Meetings and receive written reports of their child's progress in Maths during the year. Information about their child's standards, achievements and future targets in maths is shared with parents/carers at these times and also ways that parents/carers may be able to assist with their child's learning. Parents/carers are encouraged to support their children with homework.