Wheatcroft Community Primary School Policy for Mathematics 2018



Purpose of Policy

- To promote our understanding of, and passion for maths.
- To establish an entitlement of opportunities for all pupils.
- To secure consistency, high expectations across school for staff and pupils.
- To show how our character traits are embedded into our maths curriculum.

How we promote our character traits in Maths

<u>Resilience</u> - Our children understand that we learn from our mistakes. Staff model making mistakes when calculating, reasoning or problem solving. Time is dedicated to teaching fluency of methods and being able to apply these skills to a range of problems. We support our children to build stamina when calculating or solving problems.

<u>Effective Communicator</u> – Our children learn how to communicate effectively when calculating and problem solving. They explain their ideas through diagrams, explanations and jottings. Effective communication should be prevalent within all lessons through pupil collaboration, sharing ideas, explanations and discussions between staff and pupils.

<u>Compassion</u> – Our children deal with emotional concerns. They explore their own and others' emotions when it comes to maths and can openly talk about their anxieties and worries with children and staff alike.

<u>Tolerance</u> – Our children celebrate each other's abilities and respect that we all learn in different ways. They are taught how to debate answers and to respect opinions of others.

<u>Courage</u> – Our children are given; challenging questions to answer, concepts to understand, skills to learn and problems to solve. They learn that there are always more challenging questions to solve and are en<u>courage</u>d to be courageous when experimenting with ideas and methods.

<u>Integrity</u> – Our children are encouraged to realise that making mistakes is a positive experience as we can always learn from our mistakes. We encourage children to correct the mistakes they make using follow-up activities.

<u>Citizenship</u> – Our children understand how maths enhances people's lives and the real social, academic and economic usefulness that it provides. They discuss how the skills it develops are essential for learning in every other subject, for everyday living and for their futures.

<u>Maths Opportunities</u> - In addition to our character traits being promoted through Maths, we also ensure that the following *opportunities* are at the heart of our Maths curriculum:

<u>Creativity</u> – Our children are continually being creative. They calculate, experiment, investigate, reason and problem solve in a range of ways. They are creative in the ways that they present their jottings and workings and if a method fails, they persevere and try something new. They respond to problems positively and try to develop systems to help find answers and solutions.

<u>Curiosity</u> – Our children are eager to discover new things in Maths and ask questions to enhance their learning. They embark on a journey into new knowledge, with constant opportunities for investigation, discovery, analysis and using different systems. They recognise that there are always new things to learn and explore.

<u>Fun</u> – Our children's learning is driven by a sense of fun. There are regular opportunities for play and playfulness with numbers and ideas, exploring problems and games and IT programmes to enhance learning.

<u>Knowledge</u> – Our children become increasingly knowledgeable about all aspects of maths including KIRFs (Key instant recall facts) and multiplication knowledge. The pleasure and power of knowledge is promoted and gives pupils the ability to understand what they are trying to achieve and how these methods can be applied to other areas of Maths.

<u>Relevance</u> – Our children learn about real life and real experiences; the media and the digital world, and about skills that people use every day. They are encouraged to explore and to debate things that matter directly to them. The varied experiences they encounter, means pupils can apply these skills to their everyday life.

<u>The National Curriculum 2014</u>: This link provides access to the statutory programmes of study and attainment targets for Maths at key stage 1 and 2 and the following documents:

Maths appendix 1

https://www.gov.uk/government/publications/national-curriculum-in-england-mathematicsprogrammes-of-study

Clear objectives from the National Curriculum 2014 are set for each teaching session and are shared with our children. Where appropriate, success criteria are created and discussed, allowing children to evaluate their learning.

Teachers differentiate learning opportunities according to specific learning needs, targets and identified next steps. Where necessary, intervention programmes are used to support targeted groups.

Planning

Alongside the objectives from the National Curriculum, teachers are provided with the yearly overview, small steps planning and guidance and examples from the White Rose Planning scheme. This isn't a replacement for teacher's planning but is to be used as a tool to structure lessons, have high expectations of children and to pitch lessons at an appropriate level for the children in the year group.

Inclusion - We will support and challenge every child to do their best across the whole curriculum, achieving the highest standards of which each is capable.

Teachers are encouraged to use models and representations linked to the White Rose planning within their lessons to stimulate and challenge children's thinking and learning.

The yearly overview is there as a guide – some units may need more time dedicated to ensuring there is a good understanding and to ensure all objectives are covered in the unit.

Assessment

Teachers will assess pupils' understanding against the national curriculum objectives. A mixture of assessment practices will be used including: teacher assessment (continuous and summative) and tests including a baseline assessment in EYFS and statutory assessments at the end of each Key Stage. Pupil attainment and progress will be recorded every term on the school pupil tracker and an end of year summative judgement will be made and reported to parents on the annual school report.

KIRFs at Wheatcroft CP School

KIRFs (Key Instant Recall Facts) are designed to support the development of the mental skills that underpin much of the maths work in school. They are particularly useful when calculating, be it adding subtracting, multiplying or dividing. There are dedicated sessions within school to develop children's KIRFs knowledge and KIRFs are also developed through lesson when appropriate, and as starters to lessons to prepare children for the skill or concept they will be learning. KIRFs are also sent home for children to develop their skills at home. There is an expectation of 10 minutes practice per night on their current target.

These targets are displayed for children to see. In Key Stage 1, targets are presented as a display in the classroom and children's names are moved along once the target has been achieved. In Key Stage 2, targets are visible in the front of the children's maths book and are dated when achieved.

Multiplication knowledge

Multiplication of fundamental when applying maths across topics and objectives. It is essential for children to instantly recall these facts mentally without the need to calculate an answer.

In the school year 2019-20, a national multiplication check will be given to the Year 4 class that tests all multiplication knowledge up to multiples of 12.

Multiplications are taught throughout the school week and are taught in a variety of ways:

- Chanting
- Songs
- Random tests
- Pupil collaboration
- Games
- Using resources such as number lines and counting sticks.

Fluency

Fluency is at the centre of the updated National Curriculum for maths. In this context, "fluency" refers to knowing key mathematical facts and methods and recalling these efficiently. It is widely acknowledged that practice, drill and memorisation are essential if students are to become mathematically fluent. One of the three aims of the new curriculum states that pupils (of all ages, not just primary children) will: *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.*

At Wheatcroft, we provide activities and opportunities for children to become fluent in a range of skills through different activities and problems. There are three main elements to fluency:

Efficiency - this implies that children do not get bogged down in too many steps or lose track of the logic of the strategy. An efficient strategy is one that the student can carry out easily, keeping track of sub-problems and making use of intermediate results to solve the problem.

Accuracy depends on several aspects of the problem-solving process, among them careful recording, knowledge of number facts and other important number relationships, and double-checking results.

Flexibility requires the knowledge of more than one approach to solving a particular kind of

problem, such as two-digit multiplication. Students need to be flexible in order to choose an appropriate strategy for the numbers involved, and also be able to use one method to solve a problem and another method to check the results.

To help support children with their fluency, we use a range of strategies:

Manipulatives

Children learn by moving from the concrete to the abstract and structured apparatus such as Dienes can be helpful for learning about place value or number bonds. However, the meaning isn't in the manipulatives themselves – it has to be constructed by children over a period of time, through playing around with them and connecting them directly to mental and recorded calculation.

Talking about their work

At Wheatcroft, we encourage children to talk about Maths. It is not simply children sharing how they did a particular calculation, but describing why and how it worked, and how their method is the same or different to those of others. We give children opportunities to use those higher-level skills of comparing, explaining and justifying.

Consolidation in meaningful contexts

By offering children practice in context we help them to make links between the types of situations that a strategy might suit. This provides children with mathematical memory so that they recognise and make links between the concept and the methods they use.

Reasoning

Reasoning is fundamental to knowing and doing mathematics. Reasoning enables children to make use of all their other mathematical skills and so reasoning could be thought of as the 'glue' which helps mathematics makes sense. Mathematics helps us all to make sense of the world in which we live as we go about our daily lives. Reasoning is part of a much wider set of skills that are required to help us to develop mathematically and allow us to **think critically**. To do this successfully, we must continually **gather and interpret information** to **solve problems** and **make informed decisions** based on what we know. We must then **plan**, **organise** and **communicate** our ideas effectively. Therefore, reasoning skills should be cherished and be an integral part of learning for our children, rather than a bolt on at the end.

Giving the children opportunities to talk to their partners or to a wider audience by asking about what they notice, what they wonder and asking key questions like *What is the same?*, *What is different?*, *What if..., Prove it/ Convince me...* and getting them to investigate and demonstrate using manipulative resources or pictorial representations allowed the children to come up with some fantastically creative ways to demonstrate their understanding and justify their thinking.

Problem solving

Problem solving is an important skill for all ages and abilities and, as such, needs to be taught explicitly. It is therefore useful to have challenges like these at the end of every lesson.

It helps children to master topics within Maths and allows them to gain a greater understanding of the methods and reasoning linked to the concepts. Problem solving doesn't necessarily have to be a word problem and usually, the task is open-ended and can be extended in various ways.

At Wheatcroft, problem solving challenges children's thinking and understanding and develops new lines of enquiry in Maths – there really is no end to the learning that can be explored.

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Wheatcroft Character Traits

Resilient

I am able to keep going and learn even though I make mistakes.

Effective Communicator

I share my own ideas and decisions. I listen to the ideas of others.

Compassion

I am caring, thoughtful and concerned about others.

Tolerance

I celebrate and respect other people's differences, their beliefs and views.

Courage I take risks when I try new things.

Integrity

I am thoughtful and do the right thing, even when someone isn't looking.

Citizenship

I contribute to my school, community and the world to make it a better place.



