Birch C. of E. (Aided) Primary School Mathematics Policy

1 Aims and objectives

1.1 Mathematics teaches us how to make sense of the world around us through developing a pupil's ability to calculate, to reason and to solve problems. It enables pupils to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, pupils learn to appreciate the contribution made by many cultures to the development and application of mathematics.

1.2 At Birch School we use the National Curriculum 2014.

The National Curriculum for mathematics aims to ensure that 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.

1.3 We aim:

- to promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
- to promote a positive attitude to mathematics, making it relevant and meaningful, by building on pupil's knowledge and experiences;
- to promote confidence and competence with numbers and the number system;
- to foster pupil's curiosity and creativity and help them to develop the confidence to work with increasing independence and accuracy;
- to develop the ability to solve problems through decision-making and reasoning in a range of contexts;
- to develop a practical understanding of the ways in which information is gathered and presented;
- to explore features of shape and space, and develop measuring skills in a range of contexts;
- to understand the importance of mathematics in everyday life;
- to provide breadth and balance of experience for all pupils, through thorough planning, ensuring differentiation, structure and progression,

2 Teaching and learning style

We have worked collaboratively to create the 'Birch Way of Teaching Mathematics'. Please see below.

The 'Birch Way' of Teaching Mathematics

- Planned with White Rose small steps & nRich, NCETM, Teaching for Mastery, Primary Stars (KS1), Learning Trajectories (EYFS) and Twinkl.
- CPA approach.
- Flexible groupings and seats.
- Responsive teaching.
- Children seeking help through manipulatives, displays and/or a peer.
- Closely monitoring children below ARE.
- Assess with end of unit tests and termly Arithmetic & Reasoning/Problem Solving.
- Live marking in lessons, notes about support (e.g.  with Base 10).

2.1 The school uses a variety of teaching and learning styles in mathematics lessons. Our principal aim is to develop pupils' knowledge, skills and understanding in mathematics. We do this through a daily lesson that has a high proportion of whole-class and group-direct teaching. There are opportunities for flexible groupings or paired work, using differentiated tasks to allow for the range of ability.

2.2 All lessons include mental and oral skills, direct teaching, practical or written activities and a review of learning objectives. During these lessons, we encourage pupils to ask as well as answer mathematical questions. They can use a wide range of resources such as Base 10, counters, Numicon, number lines, number squares, digit cards and small apparatus to support their work.

2.3 Computers and Interactive whiteboards are available in all class bases. Pupils also use ICT independently in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Wherever possible, we encourage the pupils to use and apply their learning in everyday situations.

2.4 In all classes there are pupils of differing mathematical ability. We recognise this fact and provide suitable learning opportunities for all pupils by matching the challenge of the task to the ability of the pupil. We achieve this through a range of strategies – in some lessons through differentiated group work, and in other lessons by organising the pupils to work in pairs on open-ended problems or games. We use classroom assistants to support some pupils and to ensure that work is matched to the needs of individuals.

2.5 Using the National Curriculum, the pupils at Birch School are given the opportunities to develop the following skills:

Numeracy and reasoning skills: – mental, analytical, logic, estimation and investigative skills required for solving problems;

Observational skills: – identifying patterns, similarities, differences and changes;

Practical skills: – construction, fitting together, measuring, weighing, selecting and handling apparatus and equipment appropriately;

Communication skills: – using appropriate mathematical vocabulary, explaining their work, asking questions, listening, giving and receiving instructions, using computers to support and enhance learning and communication;

Recording: – using numbers, words, symbols and pictures to develop flexible and effective methods of recording work.

2.6 We currently split the mixed-age classes into single year groups for the teaching of mathematics as not all objectives and units of work can be aligned.

3 Mathematics curriculum planning

3.1 Mathematics is a core subject in the National Curriculum.

3.2 We carry out the curriculum planning in mathematics in three phases (long-term, medium-term and short-term). The National Curriculum gives a detailed outline of what we teach in the long term, while our yearly teaching programme identifies the Units, linked to the key objectives, in mathematics that we teach in each year.

3.3 We follow the White Rose small-step, mastery-based schemes of learning across the school. Key Stage 1 supplement this with Primary Stars Education. The medium-term plans are flexible as the class teacher will decide whether the class are ready to move on or whether they need a few more lessons to master a concept.

3.4 It is the class teacher who completes the weekly plans for the teaching of mathematics. These weekly plans list the specific learning objectives for each lesson and give details of how the lessons are to be taught. The class teacher keeps these individual plans, and the class teachers and subject leader often discuss them on an informal basis.

4 The Early Years Foundation Stage

4.1 We teach mathematics in our reception class. As the class is part of the Foundation Stage of the National Curriculum, we relate the mathematical aspects of the pupils' work to the objectives set out in the Development Matters and Early Learning Goals. We give all the pupils ample opportunity to develop their understanding of number, measurement, pattern, shape and space through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics. Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child-initiated activities both inside and outside of the classroom.

5 Contribution of mathematics to teaching in other curriculum areas

5.1 Opportunities will be planned for links to other subjects, such as science, art, technology and PE. In this way, mathematics skills can be practised in real contexts and in a purposeful way. ICT is used as a tool for the teaching and learning of mathematics, and includes the use of computers, calculators and programmable devices.

5.2 English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage pupils to read and interpret problems in order to identify the mathematics involved. The pupils explain and present their work to others during plenary sessions. Younger pupils enjoy stories and rhyme that rely on counting and sequencing. Older pupils encounter mathematical vocabulary, graphs and charts when using non-fiction texts.

5.3 Computing

Pupils use and apply mathematics in a variety of ways when solving problems using ICT. Younger pupils use ICT to communicate results with appropriate mathematical symbols. Pupils use it to produce graphs and tables when explaining their results or when creating repeating patterns, such as tessellations. When working on control, pupils use standard and non-standard measures for distance and angle, and appropriate mathematical language when using programmable devices. Pupils also use mathematics apps and websites on the iPads and laptops such as TTRS (Times tables rock stars) and White Rose One Minute Maths.

5.4 Personal, Social and Health Education (PSHE) and Citizenship

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that pupils do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that pupils do within the classroom encourage them to work together and respect each other's views. We present older pupils with real-life situations in their work on the spending of money.

5.5 Spiritual, Moral, Social and Cultural Development

The teaching of mathematics supports the social development of our pupils through the way we expect them to work with each other in lessons. We group pupils so that they work together, and we give them the chance to discuss their ideas and results. When appropriate we may study other numerical scripts and systems.

6 Teaching mathematics to pupils with Special Educational Needs

6.1 Each pupil will have equal access to the mathematics curriculum. Planning includes differentiated work, so that all pupils will be provided with learning experiences which enable them to achieve success, make progress, gain confidence and acquire competence. Teachers use a variety of teaching styles and learning activities to accommodate gender differences in learning styles.

6.2 Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, differentiation – so that we can take some additional or different action to enable the pupil to learn more effectively. This ensures that our teaching is matched to the pupil's needs. These pupils will also have additional adult support where possible. Assessment against the National Curriculum allows us to consider each pupil's attainment and progress against expected levels.

6.4 We enable pupils to have access to the full range of activities involved in learning mathematics. Where pupils are to participate in activities outside the classroom, for example, a maths trail, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

7 Intervention

7.1 We currently use Number Stacks as an intervention scheme for children identified by Target Tracker as not working at age related expectation. Number Stacks uses a unique combination of stackable place-value counters and video tutorials. Over 60 key skills from the Primary National Curriculum have been separated into 5 different categories and aligned by year group. Each Key Skill has its own video tutorial designed to be watched by an adult and child/children together. These videos break down the skills into simple, manageable steps and allow opportunities to practise each step before assessing the child's understanding with a final fluency activity.

7.2 The subject leader will identify the children not working at age related expectation each term from the Target Tracker data. Children are then put into small groups and assigned a Number Stacks teacher – this could be a teacher or a teaching assistant. Some groups meet during school time and others have after school tuition.

8 Assessment and recording

8.1 Assessment of pupils' work is continuous, and is integral to the planning and teaching of mathematics. We assess pupils' work in mathematics from three aspects (long-term, short-term and medium-term). The short-term assessments that we make as part of every lesson help us to adjust our daily planning.

8.2 Parent consultations are held to inform parents of their child's progress and to discuss their targets, and a report is also sent home in February and July.

8.3 We use assessments from the White Rose or Primary Stars Education (KS1) at the end of a unit. These assessments are used to measure progress, check for general strengths and areas to work on and to help us plan the next unit.

8.4 We also use the termly White Rose 'Arithmetic' and 'Problem Solving and Reasoning' papers for year 2 upwards.

8.5 Children take the National tests in Year 2 (optional at the end of Key Stage 1) and Year 6 (end of Key Stage 2).

8.6 In order to ensure the achievement of the expected level in mathematics in each year group, teachers meet regularly to review samples of work.

9 Monitoring and review

9.1 Monitoring of the standards of pupils' work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leader. Strategies for monitoring include teaching observations, discussions with colleagues, sampling pupils' work and teachers' plans and talking to children.

9.2 The head teacher allocates regular management time to the mathematics subject leader so that s/he can review samples of pupils' work and undertake lesson observations of mathematics teaching across the school.

9.3 The work of the mathematics subject leader also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school.

9.4 The results of standard tests are evaluated for areas that are successful and those that need development. The mathematics subject leader meets with the headteacher to discuss any strengths and weaknesses identified in the subject and indicates areas for further improvement.

10 Inset

10.1 Where appropriate, external agencies will be asked to provide school-based support. Staff will attend relevant courses to meet the needs identified in the school improvement plan. Maths staff meetings are regularly planned and led by the subject leader to provide training and share good practice.

11 Resources

11.1 There is a range of resources to support the teaching of mathematics across the school – including Base 10, place value counters, Numicon, tens frames and part-whole models. Each class has a bank of their own resources and other shared resources are stored in the shared maths cupboard. Mathematical dictionaries are available in all classrooms. Children and parents have access to TTRS (Y1-6) as an online learning resource. We also recommend other free websites and apps and update this regularly.

12 Times Tables

12.1 We have created a Superhero themed times table scheme that is used across the school to track which times tables the children know fluently and what they need to work on next. The children try to complete their next times table with a teacher or teaching assistant at least once a fortnight. Children begin this scheme in year 2. The children are awarded their Superhero certificates in our weekly Celebration Assemblies. The subject leader checks the times table folders in each class regularly.
We teach times tables in the following order: 10x, 2x, 5x, 3x, 6x, 4x, 8x, 9x, 7x, 11x, 12x.

12.2 All of the children from Year 1 upwards have their own log in details for Times Table Rock Stars which is for use at school and home. Certificates are awarded each week for the child in each year group who has earned the most coins on TTRS. We also use TTRS for termly battles between classes and we sometimes take part in nationwide competitions.

12.3 We help the Year 4 children prepare for their Multiplication Tables Check by having some small group practise sessions in the weeks leading up to the check in June. We use the Sound Check function on Times Table Rock Stars to do this.

12. 4 Year 1, 2, 3 and 4 focus on a different times table each half term. We launch each new times table with 2-3 lessons looking at patterns, different representations and links to the real world. We then use the counting stick, chanting, songs in maths starters and TTRS to further the children's confidence and automaticity.

	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Year 1	Counting in 1s	Counting in 1s	Counting in 10s	Counting in 2s	Counting in 5s	Counting in 2s, 5s, 10s.
Year 2	1x	10x	2x	5x	0x + Revise	Revise
Year 3	Revise	3x	6x	4x	8x	Revise
Year 4	Revise	9x	7x	11x	12x	Revise + MTC

13 <u>Parental Involvement</u>

13.1 We value every parent or carer's contribution to their child's learning. Maths homework is sent home regularly. All parents are encouraged to support their child's learning through informal activities. Parent consultations are held to inform parents of their child's progress and to discuss their targets, and a written report is also sent home in February and June/July.

Signed:

Date: