



Grove School

Mathematics Policy

Mission statement:

"Enjoy, learn, achieve"

Dawson Road
Handsworth
Birmingham, B21 9HB
Tel: 0121 464 4669
Fax: 0121 464 0508
E-mail:
enquiry@grove.bham.sch.uk

Headteacher: Ms J Baker

1. Introduction

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. (National Curriculum 2014)

2. The aims of the 2014 National Curriculum are for our pupils to:

- become fluent in the fundamentals of mathematics through varied and frequent practice with complexity increasing over time
- develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately
- reason mathematically; follow a line of enquiry, conjecture relationships and generalisations
- develop an argument, justification and proof by using mathematical language
- problem solve by applying knowledge to a variety of routine and non-routine problems
- breaking down problems into simpler steps and persevering in answering.

The National Curriculum sets out year-by-year programmes of study for key stages 1 and 2. This ensures continuity and progression in the teaching of mathematics.

The EYFS statutory framework for the early years foundation stage (March 2021) sets standards for the learning, development and care of children from birth to five years old and supports an integrated approach to early learning.

3. The purpose of mathematics in our school is to develop:

- positive attitudes towards the subject and awareness of the relevance of mathematics in the real world
- competence and confidence (reduce anxiety) in using and applying mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately
- initiative and motivation to work both independently and in cooperation with others
- confident communication of maths where pupils ask and answer questions, openly share work and learn from mistakes
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and investigation

4. Breadth of Study

Through careful planning and preparation we aim to ensure that throughout the school children are given opportunities for:

- mathematical fluency, reasoning and problem solving
- practical activities and mathematical games
- individual, group and whole class discussions and activities
- open and closed tasks
- purposeful practice where time is given to apply their learning
- a range of methods of calculating e.g. mental, and pencil and paper
- working with computers as a mathematical tool

Through our creative approach to teaching and learning we also seek to explore and utilise further opportunities to use and apply mathematics across all subject areas.

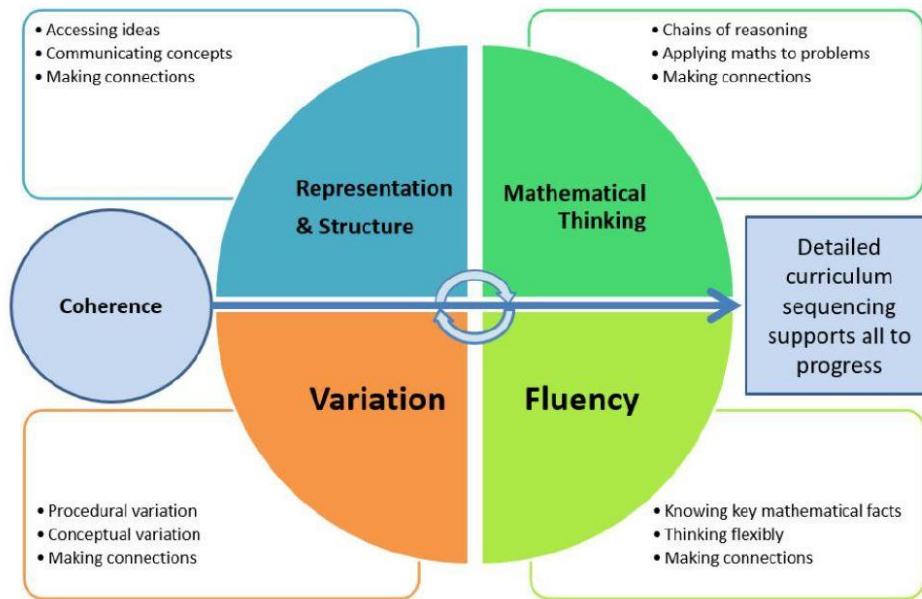
5. Teachers' planning and organisation of the mathematics curriculum

The National Curriculum for Mathematics 2014, White Rose Hub scheme of learning (EYFS, KS1 & KS2), NCETM Maths mastery and the Statutory framework for the early years foundation stage (March 2021) provide the basis for the long-term planning for mathematics taught in the school.

5.1 Maths mastery at Grove

Mastering maths means pupils of all ages acquiring a deep, long-term, secure and adaptable understanding of the subject. The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the maths that's been taught to enable pupils to move on to more advanced material.

Teaching for Mastery



Coherence

Teaching is designed to enable a coherent learning progression through the curriculum, providing access for all pupils to develop a deep and connected understanding of mathematics that they can apply in a range of contexts.

Representation and Structure

Teachers carefully select representations of mathematics to expose mathematical structure. The intention is to support pupils in ‘seeing’ the mathematics, rather than using the representation as a tool to ‘do’ the mathematics. These representations become mental images that students can use to think about mathematics, supporting them to achieve a deep understanding of mathematical structures and connections.

Mathematical Thinking

Mathematical thinking is central to how pupils learn mathematics and includes looking for patterns and relationships, making connections, conjecturing, reasoning, and generalising. Pupils should actively engage in mathematical thinking in all lessons, communicating their ideas using precise mathematical language.

Fluency

Efficient, accurate recall of key number facts and procedures is essential for fluency, freeing pupils’ minds to think deeply about concepts and problems, but fluency demands more than this. It requires pupils to have the flexibility to move between different contexts and representations of mathematics, to recognise relationships and make connections, and to choose appropriate methods and strategies to solve problems.

Variation

The purpose of variation is to draw closer attention to a key feature of a mathematical concept or structure through varying some elements while keeping others constant.

Conceptual variation involves varying how a concept is represented to draw attention to critical features. Often more than one representation is required to look at the concept from different perspectives and gain comprehensive knowledge.

Procedural variation considers how the student will ‘proceed’ through a learning sequence. Purposeful changes are made in order that pupils’ attention is drawn to key features of the mathematics, scaffolding students’ thinking to enable them to reason logically and make connections.

5.2 Concrete, pictorial and abstract (CPA) methods

It is important that children are allowed to explore maths and present their findings not only in a written form but also visually and verbally; to that end the school, in line with White Rose Hub and maths mastery continues to develop its CPA approach: concrete, pictorial, abstract. This will allow the children to experience the physical aspects of maths before finding a way to present their findings and understandings in a visual form before relying on the abstract numbers.

5.3 Medium term planning

All key stages use White Rose Maths schemes of learning for planning. These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of *depth before breadth*. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem solving elements into the curriculum.

Year group teams and class teachers prepare medium term plans using the White Rose overviews. This details the main teaching blocks for each term ensuring there are planned opportunities to reason and problem solve as well as developing fluency. Medium term planning is completed using the Grove medium term planning proforma which is saved on SharePoint.

Class teachers are required to identify children who are in receipt pupil premium by highlighting them in yellow. Ability groupings are identified to help the teacher identify which children may need adapted, scaffolded resources and to help identify the most significant SEND - their barriers to learning and any differentiated activities. There are no ability groupings in the lesson.

5.4 Short term planning

The above schemes of learning support daily lesson planning. Lessons are planned using a common planning format and are monitored at regular intervals by assistant headteachers, year group leaders and maths curriculum leaders. EYFS planning is based on their medium-term plans and delivered as appropriate to individual children with thought to where the children are now and what steps they need to take next.

All classes have a daily mathematics lesson where possible. In key stage one lessons are 45-60 minutes and in key stage two at least 60 minutes.

Teachers in EYFS ensure the children learn through a mixture of adult led activities and child-initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

Class teachers are required to save medium-term plans onto Sharepoint at the start of each new term and short-term planning by Friday each week to ensure teaching assistants the opportunity to identify their focus groups and familiarize themselves with key vocabulary, sentence stems and common misconceptions.

5.5 Special educational needs & disabilities (SEND)

Daily maths lessons are inclusive to pupils with special educational needs and disabilities. Where required, children's ISP's incorporate suitable objectives from the National Curriculum for writing or the Statutory framework for the Early Years Foundation Stage. Teachers keep these in mind when planning work. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the maths lesson. Maths interventions occur primarily within the lesson on the basis of assessment for learning.

School helps children with gaps in their learning. These are delivered by class teachers and teaching assistants and overseen by the class teacher, year group leader, assistant head teacher and SENCO. Within the daily maths lesson teachers have a responsibility to not only provide differentiated activities to support children with significant SEND but also use adaptive teaching and learning methods to provide sufficient scaffolding for the least able and challenge for children who are high achievers. It is the teachers' responsibility to ensure that all children are challenged at a level appropriate to their ability.

Moderation of pupil books, reading records and pupil progress meetings will support the identification of pupils who are not meeting expected standards in maths. Following discussion with the year group leader the following may take place:

- Targeted support within maths lessons for the pupil
- Targeted support within intervention sessions from a teacher or teaching assistant
- Inspire workshops for parents
- An Individual Support Plan with clear learning targets
- If following a series of interventions, a pupil is displaying significant needs in maths, school will seek to refer to Pupil and School Support Service.

For further information please refer to the school policy for Special Educational Needs and Inclusion.

5.6 Inclusion

Teaching maths for mastery is different because it offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, reduces maths anxiety builds self-confidence and resilience in pupils.

Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for adaptive teaching and learning and differentiation for the most significant SEND

children. Taking a mastery approach, adaptive learning and differentiation occurs in the support and intervention provided to different pupils, **not** in the topics taught, particularly at earlier stages.

There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining children, or those pupils who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention – commonly through individual or small group support within that lesson.

5.7 Organisation

EYFS

The focus in EYFS is divided into two key learning goals: number and numerical patterns.

Number: Children at the expected level of development will have a deep understanding of number to 10, including the composition of each number; subitise (recognise quantities without counting) up to 5; automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including doubling.

Numerical patterns: Children at the expected level of development will verbally count beyond 20, recognising the pattern of the counting system; compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity; explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Mathematics within EYFS is developed through purposeful, play-based experiences and will be represented throughout the indoor and outdoor provision. The learning will be based on pupil's interests and current themes and will focus on the expectations from the statutory framework for the early years foundation stage (March 2021). Mathematical understanding can be developed through stories, songs, games, imaginative play, child-initiated learning and structured teaching. As pupils progress, they will be encouraged to record their mathematical thinking in more formal ways.

“Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, ‘have a go’, talk to adults and peers about what they notice and not be afraid to make mistakes.”
Statutory framework for the early years foundation stage (March 2021)

Key stage 1 and 2

In years 1 to 6 children have a daily maths lesson of between 45 minutes in KS1 and one hour and 15 minutes in Upper Key stage 2. Children are taught in their classroom by their teacher. 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 to be identified within the lesson through use of teacher assessment and misconceptions and misunderstandings are addressed immediately.

Children are set a weekly homework task in order to strengthen their learning in mathematics. Completion of homework tasks are logged in the markbooks on Sharepoint.

Teachers use the White Rose Mastery planning and resources to aid maths teaching within school. Teachers follow the scheme of work provided by White Rose to ensure full curriculum coverage including fluency, reasoning and problem-solving opportunities are addressed within each lesson.

Every teaching block is broken down into a series of small steps that link to a national curriculum objective. To promote inclusivity each lesson begins with a lesson title of the small step taken from the White Rose Hub scheme for learning.

We have adopted a whole class approach to teaching and children work in mixed ability groups. We believe that all children should have the same standard of teaching and to ensure this we aim not to group children based on their ability.

The emphasis in lessons is to make teaching interactive and lively, to engage all children encouraging them to talk about mathematics.

Lessons involve elements of:

- Engagement – each lesson begins with a question, exploration or statement for the children to capture the child's imagination. Instruction – giving information and structuring it well;
- Demonstrating– showing, describing and modelling mathematics using appropriate resources and visual displays, using concrete pictorial and abstract representations;
- Explaining and illustrating – using accurate vocabulary and sentence stems, keeping teacher-talk to the essentials and delivering a well-paced explanations;
- Questioning and discussing;
- Consolidating;
- Reflecting and evaluating responses – identifying mistakes and using them as positive teaching points;
- Summarising – reviewing mathematics that has been taught enabling children to focus on next steps

During the medium and short-term planning process we ensure that the following are in place:

Key Stage 1

Daily use of Flashback 4 to draw on prior learning and consolidate previous learning.

Maths club badges fortnightly to develop recall of multiplication facts. The 11 maths club badge fortnightly in Year 1.

Key vocabulary and sentence stems identified on the planning and updated working wall prior to the lesson, explicitly taught so that pupils build secure foundations to allow them to present mathematical justification, argument or proof.

Regular planned opportunities to play number games and recite number rhymes

Teachers and support staff use assessment for learning within the lesson and provided focused in-lesson interventions/focus groups.

Key Stage 2

Daily use of Flashback 4 to draw on prior learning and consolidate previous learning.

Daily fluency – class teacher plans an arithmetic focus for the children and an opportunity for children to develop their confidence and fluency in arithmetic.

Maths club badges fortnightly to develop recall of multiplication and division facts.

Fortnightly arithmetic tests using Rising Stars (Years 3 and 4) Twinkl (Years 5 and 6)

Key vocabulary and sentence stems are to be identified on the planning and working walls updated prior to the lesson. This vocabulary and sentence stems are to be explicitly taught so that pupils build secure foundations to allow them to present mathematical justification, argument or proof.

Regular planned opportunities to play the Grove given games.

Weekly times tables practice using Times Table Rockstars (years 3, 4, 5 & 6) and Purple Mash (year 4).

The date for the daily mathematics lesson to be written in Roman Numerals (Years 5 and 6).

Teachers and support staff use assessment for learning within the lesson and provided focused in-lesson interventions/focus groups.

5. Home learning activities.

Children are given home-learning activities that develop and consolidate fluency. Children in years 3 – 6 to be encouraged to play Timestable Rockstars at home. Children to be encouraged to play maths-based track games with parents at home to develop their number sense.

6. Resources

Each class has a stock of core resources that are age appropriate. Additional mathematical equipment and resources are stored centrally in their resource spaces. All classrooms have wide

range of appropriate small apparatus. Concrete resources and manipulatives have been resourced for each key stage. Mathematical dictionaries are available in every class. A range of software is available to support mathematical enquiry and is accessed via Chrome books, laptops and iPads. All class teachers have access to the White Rose Hub schemes of learning and resources for teaching and learning. The Early Years Foundation Stage, Key Stage 1 classes all have Numicon resources and this resource is also available in years 3 - 6. A range of pupil books, including Busy Ant books, Busy Ant stretch and challenge, Busy Ant problem solving and reasoning, Target Your Maths, Teejay Maths, Numicon maths, are used by teachers in years 3 to 6 to supplement resources provided by White Rose.

7. Assessment and record keeping

7.1 Marking/Feedback

Marking of children's work is essential to ensure they make further progress and any feedback given needs to be in the moment as much as possible. Feedback reflects the learning objective and success criteria in line with the school marking and assessment policy. Children are encouraged to self-assess their work and to make corrections or improvements. Some pieces of work are self-marked by children where appropriate, guided by the teacher.

7.2 Daily assessment

Assessment is an integral part of teaching and learning and is a continuous process. Teachers make assessments of children daily through;

- regular marking of work
- analysing errors and picking up on misconceptions
- asking questions and listening to answers
- facilitating and listening to discussions
- making observations

These ongoing assessments inform future planning and teaching. Lessons are adapted readily and short-term planning evaluated in light of these assessments.

7.3 Termly assessment

Termly assessments are carried out in key stage one and key stage two using the assessment materials for each year group provided by White Rose in line with the schemes of learning. These materials used alongside ongoing teacher assessment support class teachers in making a next steps judgement for each child which, in line with the assessment policy, is entered into the Smart Grade tracking and evaluation tool and also on Otrack.

Outcomes of all assessments are logged electronically on the class markbooks on SharePoint. This includes raw scores for each of the tests, a total score, standardized score and teacher assessment judgement.

Standardised scores are logged termly on O Track.

Pupils in year 6 use SATS papers from previous years to assess termly at the end of the Autumn and Spring terms.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

7.4 Annual assessments

Y4 complete the multiplication check in June of each year. Y6 complete the national tests (SATS) in May.

7.5 Maths club badges:

Teachers are required to plan maths club badges in at regular intervals (at least, fortnightly) and record pupil scores in the electronic mark book. The sheets should be glued in pupil books to allow the pupil to self-assess and set personal targets. The maths club recording sheet is stuck in the back of the pupil books and should be updated by the pupil following a test. There are 3 of tests for each badge. Class teachers are to ensure these are rotated regularly.

Pupils are allowed 6 minutes to complete each of the maths club badge sheets.

For the most able pupils in years 5 and 6, the 101 maths club badge may be used.

7.6 Arithmetic tests:

Teachers in years 2 to 6 are required to plan fortnightly arithmetic tests and to record the scores in the electronic mark book. Teachers in years 1*, 2, 3, and 4 use the Rising Stars arithmetic tests. Teachers in years 5 and 6 use the Twinkl arithmetic tests or Test base created tests. Analysis of the arithmetic tests should be carried out by the class teacher and this analysis used to inform short term planning for daily fluency practice which should be identified on short-term plans. Arithmetic tests for pupils must be stored in a folder for the term and must be available for moderation.

*Year 1 children answer 6 questions in the autumn term, 8 in the spring term and 10 in the summer term.

8. Celebrating mathematical achievement

Each week there will be opportunity to celebrate participation in achievements of students in their progress in TT Rockstars and maths club badges.

9. Expectations for mathematical presentation.

- All pupils to use pencils
- One digit per square
- Short date is used (Pupils in years 5 and 6 write the date in Roman numerals)
- The small step lesson title is underlined
- A ruler is always used to draw straight lines.

- Where work is numbered, start a new question on a new line and put the number of the question in the margin.
- Pupils in years 2 to 4 to use centimetre squared books. Pupils in years 5 and 6 use 8mm squares. Pupils in year 1 to move to centimetre squared books when appropriate for the child.

10. Maths working walls

Each class must have the mathematical vocabulary and the sentence stems for each small step displayed on the maths working wall prior to that small step beginning. This can then be referred to during the lesson and support children in remembering key vocabulary and reduce cognitive load.

Where possible children's maths work on display in classrooms in order to encourage a positive attitude and enthusiasm towards mathematics for all groups of children.

Support resources on display and at an appropriate height to allow children to access them with ease. e.g. A maths 100 square, number lines, place value charts.

Class teachers may wish to display times tables posters in the classroom but these must be covered during maths club badges. Tabletop times tables should be available for pupils.

11. Correct number formation taught at Grove.

1 2 3 4 5
6 7 8 9 10

Note:

1 is the stick representation of the number.

7 does not have the horizontal bar

4 is the open representation of the number.

Staff ensure that this is correctly modelled at all times. Where pupil use a different form of the number, this is addressed in the maths books and pupils are given time to practise and consolidate the correct formation.

All large representations of the numbers above on display in the classroom must be in the agreed form.

12. Calculations policy

Grove school has an agreed calculations policy for the teaching of addition, subtraction, multiplication and division.

Pupils will use mental methods as their first port of call when appropriate, but for calculations that they cannot do in their heads, they will need to use an efficient written method accurately and with confidence.

Aims of the policy

- To ensure consistency and progression in our approach to calculation
- To ensure that children develop an efficient, reliable, formal method of calculation for all operations
- To ensure that children can use these methods accurately with confidence and understanding

See the calculations policy for further guidance.

13. Contribution of mathematics to teaching in other curriculum areas

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 children to read and interpret problems in order to identify the mathematics involved. The children explain and present their work to others during plenary sessions.

Science

During science lessons, children are able to use and apply their statistics skills when creating tables and graphs of scientific measurements. Whole class discussion of data also highlights the importance of clear recording of information. Children are also able to use a wide range of measuring devices in a real-life context. Children are required to read the scales on Newton meters, measuring cylinders, weighing scales and a variety of other instruments.

Computing

Children use and apply mathematics in a variety of ways when solving problems and programming using computing. Younger children use computing to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results or when creating repeating patterns. When working on control, children use standard and non-standard measures for distance and angle. They use simulations to identify patterns and relationships. Timestable Rockstars, Education City, Purple Mash, MyMaths, Scratch and programs such as J2Blast on BGFL365 are used in all year groups to allow children to practice and consolidate skills in a fun way.

Spiritual, moral, social and cultural development

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. As children are working in mixed-ability groups and with their maths partners, children work together, explore and discuss their ideas and results. Children also have the opportunity to assess one another's work, finding positive aspects to celebrate and suggestions for ways to improve the work.

14. Role of the maths curriculum leader

Lead in the development of mathematics throughout the school.

Help raise standards in mathematics.

Monitor the planning, teaching and learning of mathematics throughout the school

Provide teachers with support in the teaching of mathematics to ensure high-quality teaching and subject knowledge of staff.

Provide staff with CPD opportunities in relation to mathematics within the confines of the budget and the school improvement plan

Develop a coherently planned and sequenced mathematics curriculum which is reviewed regularly.

Secure and maintain the effective use of high-quality resources.

Keep up to date with new developments in the area of mathematics.

15. Monitoring and review

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the maths curriculum leader and the senior leadership team.

Class teachers prepare for termly progress meetings and the maths curriculum leader meets with teachers, assistant heads and year group leaders in EYFS, key stage 1 and 2 to review the progress of all pupils in mathematics. Pupil books and teacher records are also scrutinised at these meetings. The maths curriculum leader prepares termly reports on progress in mathematics for the head teacher and governing body.

16. Parental partnership

It is important that parents and carers are actively involved in the children's education. In order to help keep them informed of what is happening within school we have run parent workshop sessions which have looked at developments within the school, new methodologies for delivering the teaching of maths and also updating parents on any changes relating to assessment/testing arrangements.

We seek to develop our partnership with parents through:

- Attending Special Educational Needs Review meetings to review Individual Support Plan targets.
- Attending parents' consultations to review progress and share targets.
- Supporting their child completing homework.

17. Marking policy

See the presentation and marking policy for guidance.