



Mathematics Curriculum

The Brook School

Revised- July 2014

Mathematics at The Brook School

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Mathematics at The Brook School

Rationale

It is the aim at The Brook to provide a broadly based and balanced curriculum which covers all aspects of the National Curriculum and the Early Years Foundation Stage framework, using an adapted form of the Early Years Foundation Stage Curriculum, together with key stages 1 and 2 of the National Numeracy Strategy.

Learning mathematics gives all pupils the opportunities to develop an interest in, and curiosity about the world around them and use mathematics as a tool in a wide range of activities in school and everyday life. The curriculum is intended to have everyday relevance and be suited to individual needs.

In particular for some of our pupils mathematics gives them opportunities to develop an awareness of, and interest in themselves and their immediate surroundings and environment. This is through the development of early cognitive skills. The maths curriculum is, therefore, closely linked to sensori-motor development.

Planning

Our schemes of work relate to the Early Learning Goals and the Renewed Primary Framework for Mathematics Key Stage 1 and 2 and Uzgiris and Hunt's ordinal Scales of Psychological Development (see appendix 1).

In The Early Years, planning reflects the Mathematics aspect of the seven areas of learning from The Early Years Foundation Stage Curriculum in a broad range of contexts, in which the children can explore, enjoy, learn, practise and talk about their developing understanding of the area. They are given opportunities to seek patterns, make connections and recognise relationships through finding out about and working with numbers and counting, with sorting and matching and with shape, space and measure.

Curriculum leaders write three schemes of work termly, based on the topic and the school mapping. One is primarily for PMLD pupils, one for EYFS/KS1 and one for KS2. Teachers use their knowledge of their pupils and classes to decide which scheme to get ideas for activities and objectives/outcomes for individual pupils which link with their p-level/nc level, age and termly targets.

In Key Stage 1 and 2 class teachers plan using the Schemes of Work activities and ideas based on the Framework for Teaching Mathematics. Teachers use the schemes to help them plan the activities which 'best fit' the learning needs of the pupils in their class. Along with the framework, teachers ensure that they use a wide range of resources to help inform planning.

Curriculum Content

Mathematics at The Brook covers the whole P Level Scale and the lower National Curriculum levels:

At **Level P1** there is an emphasis on experience and emerging awareness of:

Noise	Touch	Vision	Smell
Vocalisation	Communication	Movement	

At **Level P2** there is a focus on developing students' skills with regard to:

Reacting, responding, engaging and cooperating in a variety of situations using the senses identified at Level P1.

At **Level P3** there is a focus on developing students' skills with regard to:

Communicating intentionally, participating with less support, sustaining concentration, exploring materials, remembering learned responses and responding to options and choices

At **Levels P4-8** there is a focus on developing students' skills in: Learning to think and problem solve in order to develop their basic understanding of patterns, the number system, calculations, shape and space, a sense of time, measurement and opportunities to use and apply those skills in a wide range of contexts.

At **National Curriculum Level 1** students will work on developing further their skills in Number, Shape and Measures with a continuing emphasis on Using and Applying those skills.

At **National Curriculum Level 2** students will work on developing further their skills in Number, Shape, Measures and Handling Data with a continuing emphasis on Using and Applying those skills.

Assessment, Recording and Reporting

Termly targets for maths (KS1/2) and Mathematics (Early Years) are set and evaluated at the end of each term and shared with parents/carers and pupils. The school also uses CASPA to generate p-level targets using the schools framework for Maths. These are in Number, using and applying and shape, space and measure. This is one measure of pupil's progress in Maths. Pupils progress is also measured using a variety of recording methods (see assessment policy)

Mathematics forms a core part of the curriculum and the DFES states that all children's p-level/NC level results at the end of KS2 and Key Stage 1 (Year 6 and year 2) are reported to the DFE and the LA, this includes children in special schools.

The DfES also states that for children with a statement of special educational needs (SEN) who are working towards level 1, a P level must be reported. The use of P scales is statutory for children with SEN who are working below level 1 of the National Curriculum. Schools will need to use P scales to record and report the achievements of those children in English, mathematics and science. At the Brook,

to ensure continuity and progression in the acquisition of maths skills children working below level 1 of the National Curriculum in Key Stages 1 and 2 are assessed using the P-Scales.

(Please see Appendix 2 for P-level information regarding performance descriptions and the school's assessment policy on reporting)

Children in the Early Years are assessed by practitioners' on going observations and assessments in Mathematics within the Statutory Framework for the Early Years. At the end of the Early Years Foundation Stage the EYFS Profile is completed, moderated and submitted to the local authority.

Data showing progression and achievement in Maths is analysed by the lead for teaching and learning on a yearly basis, this analysis then helps to inform part of the Maths action plan for the year as to where intervention and support is needed, either for particular pupils or for groups of pupils.

Improving Access to the Mathematics Curriculum

Staff can make mathematics more accessible by focusing on the senses. They can improve access by:

- using materials and resources that pupils can experience and understand through sight, sound, taste or smell
- giving pupils first-hand and direct mathematical experiences through investigations, experiments, play and visits
- presenting materials and resources that pupils can understand through sight, touch, sound, taste or smell
- allowing pupils to observe and gain a mathematical understanding where, because of visual or multi-sensory impairment or mobility difficulties, pupils cannot experience incidental learning of the wider world and the environment

Staff can also improve access by:

- using ICT, visual and other materials to increase pupils' knowledge of their personal surroundings and the wider world
- using mathematical contexts (domestic and environmental) that are of interest, and are relevant and meaningful, to pupils
- using specialist aids and equipment
- encouraging support from adults or other pupils, whilst giving pupils space and freedom to do things for themselves, allowing them sufficient time to respond
- adapting tasks or environments and using alternative activities where necessary, for example, where pupils have allergies to plants or animals
- being aware of the pace at which pupils work and of the physical effort required
- balancing consistency and challenge, according to individual needs
- The sharing and ideas and resources
- Attending CPD and developing their knowledge and skills in Maths through reading and discussion.

Teaching mathematics can help pupils develop their broader communication and literacy skills through encouraging interaction with other pupils as well as staff. With some pupils, communication and literacy skills develop as they use a range of visual, written and tactile materials, for example, large print, symbols and symbol text. These skills also develop as pupils use ICT and other technological aids. Other pupils' skills develop as they use alternative and augmentative communication, for example, body movements, eye gaze, facial expressions and gestures, including pointing and signing.

(Taken from Equals Mathematics Strategy KS 1& 2)

Monitoring and Evaluation

Within Mathematics monitoring and evaluation by teachers together with the class staff should take place regularly to ensure that individual learning needs are met and achievements recorded. Planning must take into account the need for activities to be differentiated and allow for progression

The maths curriculum leaders, together with the school curriculum leader, are responsible for the monitoring of maths to ensure curriculum coverage, progression and continuity throughout the school, and to support staff in curriculum delivery.

The Maths curriculum leaders carry out yearly Maths learning walks. Learning walks form an important part of our school teaching and learning development. By monitoring and offering support, curriculum leaders can get an overall picture of how their curriculum area is being planned, taught and assessed. They advise teachers, class staff and children as to how to keep improving and they also get feedback from them as to how they can improve their curriculum area. This process contributes to the continuous development of teaching and learning within the school.

Equal Opportunities

We value the difference and diversity of our school population and always strive to ensure that this enriches the cultural content of our syllabus. At The Brook school we will ensure that resource material reflects the wide cultural background of our pupils. We will ensure that girls have equal access to the maths curriculum.

Appendix 1

The Uzgiris and Hunt's Ordinal Scales of Psychological Development identifies 6 scales of development. These are:-

- **Visual Pursuit and the Permanence of Objects**

This starts with the pupils focusing on objects/people, which leads on to tracking i.e. following moving objects with their eyes in various directions. They begin to have some understanding of object permanence i.e. out of sight is not out of mind by, for example, turning head in anticipation of the reappearance of an object and securing a partially hidden or fully hidden object. Gradually full understanding of object permanence is established

- **Means For Obtaining Desired Environmental Events**

This is concerned with the means by which children solve problems. Through trial and error pupils begin to understand that they have some control over objects e.g. they will repeat an arm movement to keep an object activated e.g. banging or spinning. Later they begin to see the relationships between object e.g. will pull a cloth to get an object placed on it. They also begin to use a variety of tools e.g. chair to climb on, stick to push something out

- **Development of a) Vocal Imitation and b) Gestural Imitation**

a) This starts with differentiated coos and distress sounds, imitation of sounds already in repertoire. It leads on to imitation of some new sounds and then most sounds.

b) This is about imitating familiar own-body actions, imitating visible gestures, and imitating new models of gestures

- **Development of Operational Causality**

This is about developing understanding of cause and effect i.e. if I do something, something will happen. It begins with simple actions e.g. pupils understand that touching an object may make it change its position or make it produce a noise, or that smiling/vocalising at an adult will keep their attention. This leads on to more complex actions both with objects e.g. unscrewing a bottle/jar to get object or activating a more complex switch; and with people e.g. taking an adults hand or giving the object to the adult to activate

- **Construction of Objects In Space**

This is about developing understanding of the function of objects e.g. that a cup is for drinking. It is also about how objects relate to each other e.g. that 2 objects can be used together – hitting a drum with a stick or putting bricks in and out of containers or building towers of bricks. It is about the understanding of spatial relations and the position of objects e.g. that things can go in, on, over etc.

- **Schemes for Relating to Objects**

This is about how pupils develop understanding of what you can do with objects. At first they will use simple actions on objects regardless of the object e.g. banging on table or shaking but gradually they develop understanding of more complex actions e.g. that you can push, pull, throw, tear, etc This eventually leads to symbolic play e.g. using a stick as a spoon to feed a doll

Throughout all these areas is the development of reach and grasp. The co-ordination of hand and eye is extremely important for the pupils to learn about the environment. It is the first steps in the development of manual skills. It is also important for the development of exploratory play and it gives the pupils understanding of cause and effect i.e. if I touch something, something will happen. It is acknowledged that the skills associated with reaching and grasping may not be possible for some of our pupils who have complex physical or visual disabilities and teachers will develop other strategies to allow our pupils to gain mathematical understanding

Strand 1 – Using and Applying Mathematics – for our pupils this strand is central. It allows us to link and apply mathematical knowledge and understanding to everyday life and to all the areas of sensori-motor development specified above. It also shows the importance of cross curricular linking maths to other areas of the curriculum. For example, using and applying maths in real situations such as use of money in shopping; or café sessions where matching, sorting, sequencing, counting and money skills are required.

It allows us to teach mathematical concepts in a multi sensory way, engaging pupils through language, music, movement, rhythm at a variety of levels. It emphasises that developing communication is an important part of learning in mathematics

Solving problems lies at the heart of mathematics. For our pupils it involves anticipation, thinking about what might happen, and deciding what action to take. It begins with the awareness that actions have consequences and that these are linked, for example, by operating a switch to play music or move a toy. Anticipation can be encouraged by exaggerating and building-up a coming event, for example, 'Wait for it, wait for it ...'.

Strand 2 – Counting and Understanding Numbers (to include Strands 3 & 4 - Knowing and using number facts and calculation) is also concerned with the earlier skills of visual pursuit and the permanence of objects and communication. That is, before understand numbers you have to be able to follow/track along a line; understand that objects still exist even when out of sight; know that objects have names and join in with and anticipate familiar rhymes

Strand 5 – Understanding Shape – to understand shape pupils first have to interact with and explore a wide range of objects and materials by using their senses of sight, hearing, smell, touch and taste to find out about their properties. Pupils learn to combine objects e.g. banging a drum with a stick. They also learn to combine shapes and make patterns and pictures with them.

When combining objects, pupils also learn about the spatial relations between objects. They develop spatial awareness and the ability to judge distance and direction through experiencing movement in the class and wider environment e.g. swimming, trampoline, parachute games. They explore the position of objects through everyday activities e.g. cups on table, biscuits in the tin

Strand 6 – Measuring – as with shape, this starts with the pupils interacting with and exploring a wide range of objects and materials through all the senses. They learn to discriminate and differentiate between objects e.g. big/small; hard/soft; likes/dislikes and then to compare and contrast objects in relation to measures i.e. size, weight, length etc

This strand is about developing awareness and an ability to anticipate and predict within routines or familiar situations. Pupils recognise objects of reference/ symbols of activities and relate them to activities or specific days. This leads to an understanding of time

Strand 7 – Handling Data is linked to Means for End and Operational Causality i.e. pupils learn increasingly complex ways of making things happen, getting repetition and ways of getting objects. They begin to understand the function of objects e.g. that a cup is for drinking, a brush for combing your hair. They learn to match, sort and classify a range of objects

Performance descriptions outline early learning and attainment before Level 1 in eight levels from P1 – P8. We have taken each of the P level descriptions for mathematics and broken them down into more detailed and specific learning outcomes for pupils with severe and profound learning difficulties. Teachers can use these level indicators to develop and support more focused approaches to ongoing teacher assessment and to help with both medium and long term planning.

Teachers can also use these P level outcomes to record pupils' overall development and achievement, for example, at the end of a key stage.

Within a class there may be pupils working in any of the above P level stages. It is also acknowledged that some pupils will work at the earliest stages (P1 – P3) throughout their school career.

Appendix 2

Performance descriptions

Performance descriptions outline early learning and attainment before Level 1 in eight levels from P1 – P8. We have taken each of the P level descriptions for mathematics and broken them down into more detailed and specific learning outcomes for pupils with severe and profound learning difficulties. Teachers can use these level indicators to develop and support more focused approaches to ongoing teacher assessment and to help with both medium and long term planning.

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The performance descriptions for P1–P3 are the same across English, mathematics and science. The descriptions show the range of overall performance that pupils at this level might demonstrate. If a pupil is at P1i–P3ii level in English, then reading, writing, speaking or listening levels would normally be appropriate. If a pupil is at a level higher than P3ii in English, then separate levels (P4–P8) can be given in reading, writing, speaking or listening and an overall English level is not expected.

This also applies to mathematics, number, using and applying mathematics, and shape, space and measures. For science, a single level from P1–P8 should be given. There may be exceptional circumstances where a pupil is judged to be at P1i–P3ii in English and/or mathematics but at P4–P8 in a particular element of the subject. The school management information system should allow these different levels to be recorded and will transfer all levels entered for each pupil.

Acknowledgements

The following documents have been useful in writing this document and are recommended to staff for further reading

The renewed Primary Framework for Literacy and Mathematics

Electronic version of Framework at www.standards.dfes.gov.uk/primaryFramework

Foundation Stage Early learning Goals

Uzgiris and Hunt Assessment in Infancy – ordinal Scales of Psychological Development

EqualS SLD & PMLD Curriculum Policy Documents

EqualS Mathematics Strategy KS1 & 2 + KS3 & 4

Nelson Mathematics Teachers Resource File – Towards Level One

Key Stage 3 National Strategy – Assessing the NC for Mathematics – examples of what Pupils with SEN should be able to do at each P Level

