

Mathematics – (Specific Area)

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.

Aim

To foster enthusiasm, confidence and the development of knowledge in exploring, using and applying a broad range of mathematical concepts through the following aspects:
Numbers / Shape, space and measure

Objectives

To provide all children with broad and varied experiences in which mathematical language, skills and concepts can be created, supported and nurtured.

Operating Policy

The children will have an opportunity to observe peers and adults using and applying mathematical skills and concepts in everyday situations and activities. Maths is seen as part of the whole curriculum and potential for developing mathematical awareness is built into all the activities provided by the setting. The children will have the opportunity to explore the properties of a wide range of materials in a range of contexts which will include free-play experience with and without adult input, and experience of real life situations such as cooking, shopping, sharing etc. (role play may be used to develop these experiences). Confidence and enthusiasm will be supported through sensitive adult input which will provide for open ended questioning and the development of mathematical thinking and language.

Programme of Work

Learning will be achieved primarily through children's interests but also via a mixture of subject, cross-curricular and child initiated topic based activities. The curriculum will be delivered through both adult led and structured/ free-play activities.

The programme of work will include opportunity for topic based and general activities, which will encourage the children to explore, investigate and question. Activities will involve the use of both natural and made material, selected to support the children's learning. The activities will be of a free-play or adult directed nature. Where play is properly structured, and there is sensitive intervention and language input from adults, the child can gain knowledge of mathematical concepts and language in an incidental manner.

The children need many experiences of sorting, matching and comparing a wide variety of objects and materials in order that they can begin to count systematically and understand

the true meaning of number. There are certain concepts which the child needs to understand, and in planning activities we aim to provide the children with practical experience to enable the development of this understanding. In planning these activities we are very much aware that each child is an individual and that not all children will grasp concepts and ideas at the same rate or level. It is of utmost importance that the child is allowed to explore and experiment before being given more structured activities – ideally there will be four stages of development in the mathematical experience of the children:

1. Children are encouraged to play with as many activities and materials as possible without adult intervention.
2. Children play with materials which have been deliberately provided by the adult, in order to encourage the acquisition of certain concepts, but still without adult intervention.
3. Children play with materials of their own choice with the active involvement of the adult.
4. Children play with materials selected, guided and led by the adult.

The programme will enable children to achieve the following at the expected level of development

Number

- 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 double facts

Numerical Patterns

- 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

Activities might include

- Free-play with a wide variety of objects – shells, leaves, bricks, toys etc. with language input from the practitioner where appropriate.
- Model making using boxes and junk materials.
- Describing and identifying shapes – using language such as fat, thin, long, short, spiky, sharp, smooth, etc can be introduced.
- Use positional language – e.g. under, over, backwards, forwards etc.
- 'Feely' boxes.
- Simple movement themes – long shapes/snakes, short shapes/a tiny seed, etc.
- Play with jigsaws.
- 2D patterns – printing, painting, paper cutting etc.
- Collage.

- Drawing around shapes.
- Shapes in the environment – around school, traffic signs, vehicles, food etc.
- Symmetry can be experienced – butterfly painting, paper folding.
- Free sorting according to the child's own choice.
- Sorting by one attribute e.g. 'let's find all the red ones'.
- Sorting by two or more attributes from a simple collection of objects e.g. 'find the blue cars' from an assorted collection of vehicles.
- Sorting more than one type by one or more attributes from a mixed collection e.g. 'find the big red beads and the shiny black buttons'.
- Cooking – sorting ingredients and equipment, things which melt, things which do not, foods we have to chew, liquids or solids, hot or cold etc.
- Art – making pictures by selecting one colour from a mixed box of collage materials, making sets of objects with a variety of materials.
- Sand – sorting objects which have holes, handles, are large or small, etc.
- Water – sorting objects which float or sink, sorting objects which hold water and those that do not, sorting the equipment by shape, size or colour.
- Construction toys – sorting by colour, shape, size, texture, etc.
- Stories/rhymes – choosing all the stories with pigs in them, or all the songs with frogs etc.
- Imaginative play – sorting all the teaspoons from a collection of spoons, all the cups, finding clothes according to colour/size, sorting all the fruit/vegetables into colours, families, etc
- Practitioner finds one object, child finds the match.
- Matching sequences – red bead, blue bead, red bead, blue bead, etc.
- Matching one cup to one saucer, knife and fork to place, spoon to dish, etc.
- Matching apron to activity – art apron, water apron.
- Buttoning coats – one button to one hole.
- Making patterns and copying them: both on paper and non-permanently with a variety of objects including sand.
- Matching by size, shape, texture, taste, etc.
- Matching to music activities.
- Putting toys back in appropriate places
- Looking for patterns in the environment inside and outside e.g. brickwork, floor tiles, animal markings and around the setting.
- Making patterns in painting, printing and collage activities.
- Making 3D patterns with bricks and beads.
- Copying and continuing patterns on paper and 3D.
- Using computer programs to create and manipulate patterns.
- Recognise and recreate simple patterns.
- Patterns in music and dance.
- Looking at and talking about pictures which contain varying amounts of objects.
- Playing with grading blocks, number pegs, grading jigsaws, bead stairs, compare bears etc.
- Ordering groups of objects.
- Ordering numbers.
- Putting sets of objects in order of size.
- Practitioner finds one object, child finds the match.
- Matching sequences – red bead, blue bead, red bead, blue bead, etc.
- Matching one cup to one saucer, knife and fork to place, spoon to dish, etc.
- Matching apron to activity – art apron, water apron.
- Buttoning coats – one button to one hole.
- Matching by size, shape, texture, taste, etc.

- Putting toys back in the appropriate places.
- Reciting number rhymes.
- Reading counting books.
- Counting in games and activities.
- Counting reliably in other contexts such as clapping, jumping etc.
- Counting in 2's and 10's.
- Numerals are displayed throughout the setting both inside and outside.
- Opportunities to observe correct formation of numerals.
- Toys and activities are used to encourage number recognition.
- Numbers in the environment are talked about and written down.
- Drawing the corresponding number symbol next to a group of objects.
- Recognise numbers 1 to 5 and then beyond.
- To solve number problems.
- Activities to develop the vocabulary involved in adding and subtracting.
- Activities based on 'more' or 'less'.
- Relate addition to combining two or more groups of objects.
- Begin to relate subtraction to taking 'away' by counting how many are left.
- Activities of a simple and incidental, questioning nature – e.g. 'I wonder whose bottle holds the most water?'
- Activities to develop mathematical ideas and methods to solve practical problems involving counting and comparing in a real or role play context.
- Play with fake money. Adults to introduce language related to money.
- Role play situation; 'Buying' items, 'giving change'.
- Children can accompany staff to the local shops to purchase items for use in the setting and observe the exchange of money for goods.
- Discussion about how the children's day is divided into 'times' – playtime, story time, drinks time, lunch time, home time, etc.
- Discussion about how adults use clocks and watches to help them know what time it is and therefore what time, according to the clock, we have drinks or go outside etc.
- Free-play with watches, clocks, timers etc to help the child recognise the role of number in telling the time and partitioning the day into times for doing certain activities.
- Discussion about days of the week, yesterday, tomorrow, last week, next week, etc.
- Discussion about the seasons can also help to develop a sense of awareness about time and the passage of time.

Planning, recording and assessment

Individual targets and activity planning occurs on a weekly or daily basis. The weekly planning and activity planning sheets used by the setting are laid out to identify each of the areas of learning; however staff should recognise that some areas of learning may not fit into a topic or child's interests and therefore need to be planned separately and spontaneously.

Planning also occurs on a weekly or daily basis whereby staff enhance a specific mathematics activity for the children to experience – children will usually have chosen these activities, but occasionally staff will help them make choices. Items can be rotated so that children can select their chosen resources, providing broad experience for the children.

Staff are able to observe the children and records of such observations can be made on the children's personal profile sheets or on activity record sheets.

Samples of the children's work which relate to Mathematical Development are kept in the child's individual folder as appropriate.

Assessment is carried out through a mixture of informal observation, interaction with the child, the use of the information on record sheets and discussion during regular staff meetings. The information gathered during the assessment process is then used for future planning of activities for each child.

However assessment should not entail prolonged breaks from interaction with children, nor require excessive paperwork. When assessing whether an individual child is at the expected level of development, staff draw on their knowledge of the child and their own expert professional judgement and should not be required to prove this through a collection of physical evidence.

Information gained through recording, assessment and professional judgement will be shared with parents, other school staff and outside agencies as appropriate to address any learning and development needs.

Resources

It should be remembered that mathematics embraces all areas of learning and therefore all resource lists need to be referred to.

Resources available are located in the Resources file.

Documentation

It is available to any person who wishes to read it and pass a comment. The policy is to review and amend the above as and when appropriate, minimum period two years.

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