ISE Primary Division

Mathematics Policy

Updated November 2021

This document is a statement of aims, principles and strategies for the teaching and learning of Mathematics at the International School Eindhoven.

Definition of Mathematics:

Mathematics teaches children to

- 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
- **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.
- develop **personal attributes** of adaptability, resilience, enquiry, respect, co-operation, communication initiative, accuracy, systematic logical thinking and is a source of interest and fun.

Philosophy:

Through their growing knowledge and understanding children learn to appreciate the contribution made by many cultures to the development and application of Mathematics.

Aims and Objectives:

Our aims in the teaching of Mathematics are:

- To promote enjoyment of learning through practical activity, exploration and discussion;
- To promote confidence, enthusiasm and a sense of achievement;
- To promote a high standard in numeracy and a range of mathematical skills;
- 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 space and shape and to develop related measuring skills in a range of contexts;
- To calculate accurately, both mentally and with formal written methods, drawing on a range of calculation strategies.

The principle focus during groups FD and 1 will be to:

- Count reliably with numbers from 1 to 20, place them in order and say which number is one

more or one less than any given number.
- Use quantities and objects to add and subtract two single-digit numbers and count on or back to find the answer.
- Solve problems, including doubling, halving and sharing.
- Use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems.
- Recognise, create and describe patterns.
- Explore characteristics of everyday objects and shapes and to use mathematical language to describe them.

The principle focus during groups 2 and 3 will be to:

- Develop confidence and mental fluency with whole numbers, counting and place value.
- Recognise, describe, draw, compare and sort different shapes and use related vocabulary.
- Use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- Know the number bonds to 20 and be precise in using and understanding place value.
- Read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge.

The principle focus during groups 4 and 5 will be to:

- Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.
- Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Solve a range of problems, including simple fractions and decimal place value.
- Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Use measuring instruments with accuracy and make connections between measure and number.
- Memorise their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

The principle focus during groups 6 and 7 will be to:

- Extend their understanding of the number system and place value to include larger integers.
- Develop connections that they make between multiplication and division with fractions, decimals, percentages and ratio.
- Solve a wider range of problems, including increasingly complex properties of numbers and arithmetic.
- Write efficiently the mental methods of calculations when solving problems.
- Use the language of algebra as a means for solving a variety of problems
- Extend their knowledge in number by using geometry and measures.
- Classify shapes with increasingly complex geometric properties.
- Be fluent in written methods for all operations including long multiplication and division, and in working with fractions, decimals and percentages.
- Read, spell and pronounce mathematical vocabulary correctly.

Mathematics will be linked to other subject areas and included in cross-curricular projects where possible.

Inclusion

In all aspects of school life we are committed to providing equal opportunities for all, regardless of their proficiencies in English or home language. We are committed to teaching with an awareness of different learning styles and adapting the curriculum accordingly. We do this by many forms of differentiation and extension.

Teaching & Learning

Mathematics is based upon three connected levels of planning:

- Long term planning: ISE Numeracy Framework (based upon the Abacus Framework) and the National Curriculum in England
- Medium term plans: termly outlines of work, main teaching objectives and when these will be taught, in line with the Abacus Mathematics Scheme
- Short term plans: weekly plans detailing activities and resources and teaching points for each lesson. Also included is differentiated learning, teaching focus and use of additional support, including ICT
- Teachers work closely with colleagues in parallel classes to ensure that there is effective continuity and progression through appropriate challenge and learning across the age range

A daily Mathematics lesson of at least 60 minutes, structured as follows:

- Oral work and mental starter -Whole class work to rehearse, sharpen and develop mental and oral skills.
- The main teaching activity -Teaching input and pupil activities. Work as a whole class, in groups, in pairs or as individuals, differentiated accordingly.
- A plenary session to reiterate the content of the lesson and assess whether the learning objective has been achieved.

Incidental mathematics (five minute fillers)- These are activities that often:

- Can be completed in 5 minutes or less
- Require little or no resources
- Are oral rather than written
- Are suitable for the whole class or a large group
- Children will improve with familiarity
- Will build children's confidence

These activities should take place daily during transitional moments or other free moments throughout the day; for example, while lining up, getting changed for gym, waiting for the next lesson to start, before home time, etc. Each class has a set of teacher resources that can be used for this purpose.

Differentiation

In all classes, children have a wide range of mathematical ability. We recognise this and aim to provide suitable learning opportunities for all children by matching the challenge of the task to the ability and experience of the child. We achieve this by planning differentiated activities into our weekly planning as appropriate, by using mathematical games and investigations.

We may also group children according to need within the class and have individual work or paired work as well as whole class teaching. Children who are judged to have specific needs are assessed by the Educational Needs team in consultation with the class teacher. A Plan of Approach may then be drawn up to help provide specific additional support for the child. The POA will reflect which level of differentiation is needed and this will need to be accounted for in the weekly planning. This may take place within the classroom lesson or be provided as additional support by another teacher.

More able children are also provided with additional activities and challenges to further enhance their learning at an appropriate level. When considered necessary and appropriate, Maths Club may be offered by the EN department staff for Advanced Learners in Maths.

Home Learning

Mathematics home learning will be given in accordance with the school home learning policy. Abacus games and/or homework worksheets will be allocated regularly by class teachers. On occasion, teachers may allocate Problem Solving cards to encourage Maths discussion at home. Additional practice of times tables may be allocated on Times Tables Rockstars or through other resources.

Presentation of Work

Mathematics written work should be recorded in accordance with the ISE presentation policy.

A consistent approach to presentation of work informs the teacher as to which calculation strategies a child is using and also provides evidence of progress achieved. Written work is to be legible and clearly set out. Recording should be completed with a pencil in exercise books as appropriate. From group 2 onwards, work should be dated (01/01/10) and have the learning objective. From group 4 onwards, work should include the textbook page number (where appropriate).

Where appropriate, children should be encouraged to record and communicate their learning and understanding of Mathematics in a variety of ways.

- Plain paper exercise books should be used in Groups 1.
- Large squared books should be used in group 2.
- Centimetre squared books should be used in Groups 3, 4 and 5.
- Groups 6 and 7 should use small squared books and write with a pencil. In centimetre squared books children should write only a single digit in each square.
- When appropriate, books from other year groups should be used.
- A ruler should always be used for all straight lines from Group 4 or where the activity requires its use for accuracy.
- Teachers are responsible for teaching the children to organise their page appropriately to show methods of working.

Record Keeping and Assessment

Formative assessment involves teachers keeping their own individual records on children which allow them to know where a child is in learning in terms of knowledge, skills and understanding and to facilitate progression and continuity. Such assessment will also be used to inform planning. This informal assessment may take a variety of forms such as: observation, discussion, questioning or via written work including tests, mathematical games and investigations.

Formative assessment is based on the Abacus assessment toolkit, which we have adapted to form Brain Training. Groups 3 -7 carry out a pre-assessment using the arithmetic test and the problem solving and reasoning test every five weeks. After this pre-assessment, planning may be adapted according to class or individual needs. Following five weeks of teaching, the post-assessment is carried out and students are able to recognise the progress they have made. Students then set individual goals based on their Brain Training and teachers adapt their planning for the next block of teaching units.

Reporting

Reporting to parents is achieved by –

- Written school academic reports twice per year.
- Parents' meetings twice per year.

- Additional meetings by arrangement when necessary.
- Reporting in Mathematics will focus upon each child's:
- Attitude towards Mathematics
- Competence in basic skills and developing mathematical expertise
- Ability to apply mathematical knowledge to new situations

Feedback to Pupils

Feedback to pupils about their progress in Mathematics is achieved by effective formative assessment which:

- Aims to be encouraging and supportive and move children on;
- Is often carried out through discussion between child and teacher during a task;
- May on occasions be carried out by pupils marking their own or each other's work when this is deemed to be appropriate and effective;
- Will be a discussion point after pre- and post- Brain Training assessments;
- Focuses on the student setting Individual targets encourage them to work towards a specific learning objective.

Continuity

At the end of the year information about progress and individual difficulties will be passed on to the next teacher at an arranged meeting. All appropriate records of Brain Training formative assessments will also be passed on.

Resources

Mathematics resources are relevant and in line with current mathematical teaching practices. Where appropriate ICT resources are used in the form of software, the interactive whiteboard and the Internet as appropriate. Calculators may be used as a teaching and learning aid.

The school Mathematics programme is based upon the Abacus toolkit but may be augmented by material from other sources including the Internet.

Each classroom has a teacher resource set in a Maths trolley, which can be used for the incidental teaching of mathematics and during mathematics lessons. We also have a large range of shared resources which are divided into upper and lower school.

Monitoring and Evaluation

The standards and quality of the teaching and learning of mathematics will be monitored by the mathematics coordinator and the Leaders for Learning through lesson observations. Areas of best practice and areas to be developed will be identified and discussed. Brain Training results will be monitored by the mathematics coordinator to look for consistency and trend across the year group. INCAS results will also be monitored by the EN department and Leaders for Learning to look for general trends across year groups.