Mathematics Policy

September 2024

Review date: September 2026

THE NATURE OF MATHEMATICS

Mathematics is a tool for everyday life. It is a network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real-life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Using the Programmes of Study from the National Curriculum and Development Matters we aim to develop:

- a positive mindset/attitude towards mathematics.
- procedural fluency and confidence in mathematical knowledge, concepts and skills.
- an ability to solve problems, to reason, to think logically and to work systematically and accurately.
- initiative and an ability to work both independently and in cooperation with others.
- an ability to communicate mathematics.
- meaningful and purposeful lessons, fostering the ability to use and apply mathematics across the curriculum and in real life.
- suitably challenging lessons which allow all children to make progress through varied and rich activities.
- an understanding of mathematics through a process of enquiry and experimentation.

SCHOOL POLICY AND THE NATIONAL CURRICULUM

Knowledge, Skills and Understanding:

In early years the curriculum is guided by 'Development Matters' and the 'Statutory Framework for the Early Years and Foundation Stage'.

At KS1 and KS2, the National Curriculum Programme of Study is used to ensure continuity and progression in the teaching of mathematics.

At all times, we endeavour to set work that is challenging, motivating and encourages the pupils to talk about what they have been doing.

Breadth of Study:

Through careful planning and preparation, we aim to ensure that children learn in ways which maximise their chances of success and that they are given opportunities to experience:

- practical (concrete) activities which reveal the structure of key mathematical concepts.
- rich, varied and increasingly sophisticated problem-solving tasks and mathematical games.
- individual, paired, group and whole class discussions and activities which develop the use of mathematical language.
- reasoning mathematically by following a line of enquiry, conjecturing relationships and generalisations and developing an argument, justification or proof using mathematical language.
- open ended and closed tasks.
- appropriate levels of challenge which allow individuals to aspire to higher levels of attainment.
- the benefits of commitment, perseverance and cooperation.
- a range of methods of calculating e.g., mental, pencil and paper and using a calculator.
- working with ICT as a mathematical tool.

SCHEME OF WORK

The scheme is a working document and as such is composed of ongoing plans produced on a week-by-week basis. This is developed from the National Curriculum using 'small steps' to ensure important concepts are taught explicitly, taking into consideration the needs of our children and the differing abilities within each year group.

CROSS-CURRICULAR LEARNING

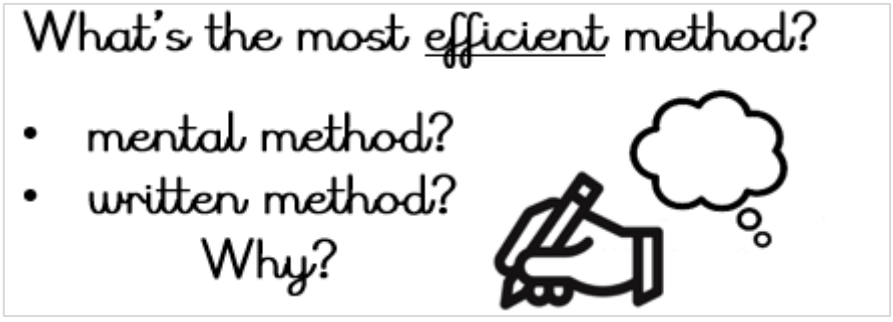
Throughout the whole curriculum, opportunities exist to extend and promote mathematics. Teachers seek to take advantage of all opportunities so that children experience the application and use of Mathematics in real contexts.
It is important that time is found in other subjects for pupils to develop their mathematical skills and cross-curricular lessons to be planned for regularly.

MENTAL MATHS

Regular mental maths sessions will also be planned for (outside of the daily maths lesson) where children listen to a range of questions from across the curriculum which they solve mentally or by making notes/jottings.

The most important aspect of mental maths is how the class teacher enables discussions between children regarding the mental calculations they used, drawing out the underlying concepts, comparing ideas and looking at which methods are most efficient. An emphasis on positive mindsets and the process of learning should be fostered rather than focusing on the scores achieved.

The teacher should model efficient thinking and note-taking to children to accelerate learning across the curriculum. Just reading out the answers will not achieve this.



REASONING

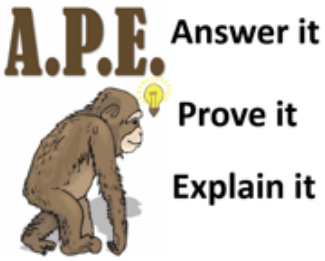
The National Curriculum states that ***all*** pupils should be given opportunities to reason mathematically.

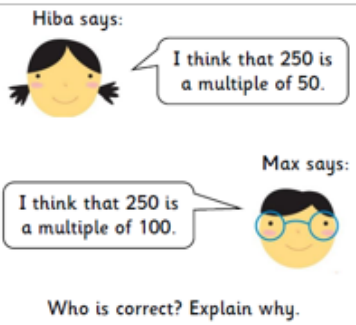
When answering specific reasoning questions, children should follow the A.P.E. format (Answer it, Prove it, Explain) to help them construct a full and well considered answer.

Reasoning:

Break a reasoning problem down into 3 parts.

- **A) Your answer.**
- **P) Your proof (using a number sentence or sometimes an image for a geometry question).**
- **E) Your explanation of why something is or is not correct.**





A) Answer it:

Hiba is correct.

P) Prove it:

50 x 5 = 250

E) Explain it:

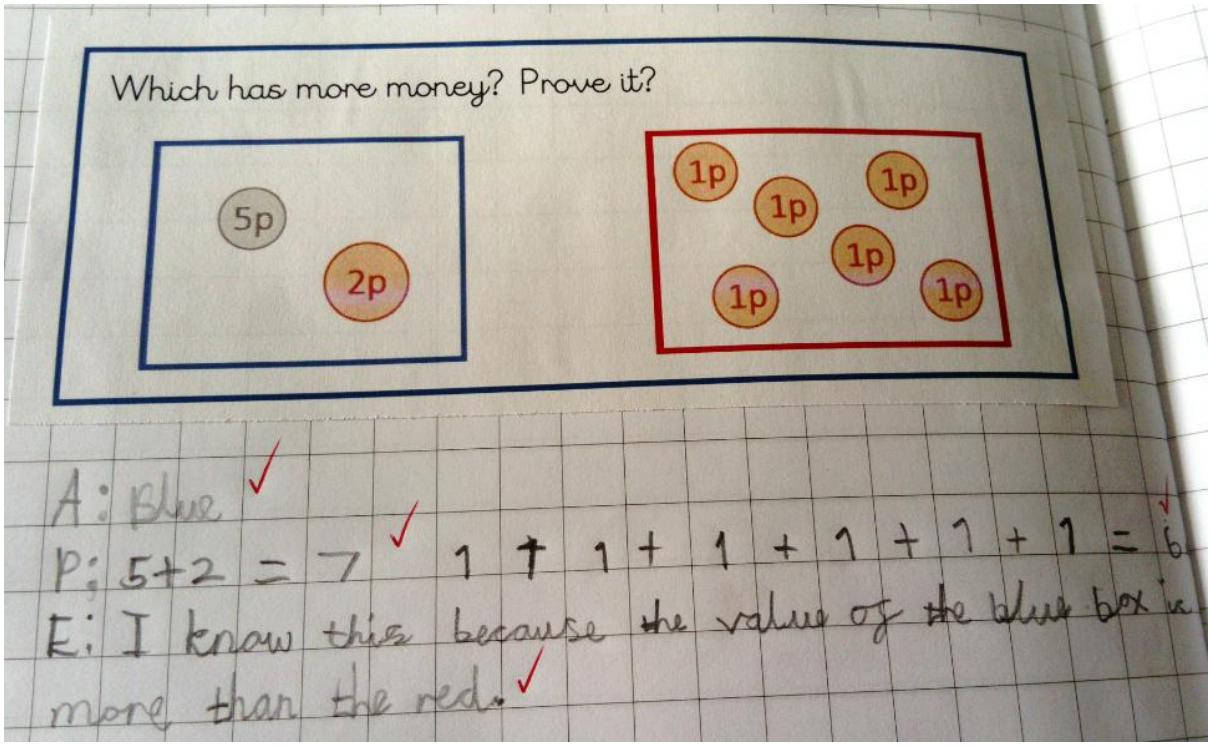
Max can't be correct because multiples of 100 have a zero in the tens column not a 5: 100, 200, 300, 400, 500…

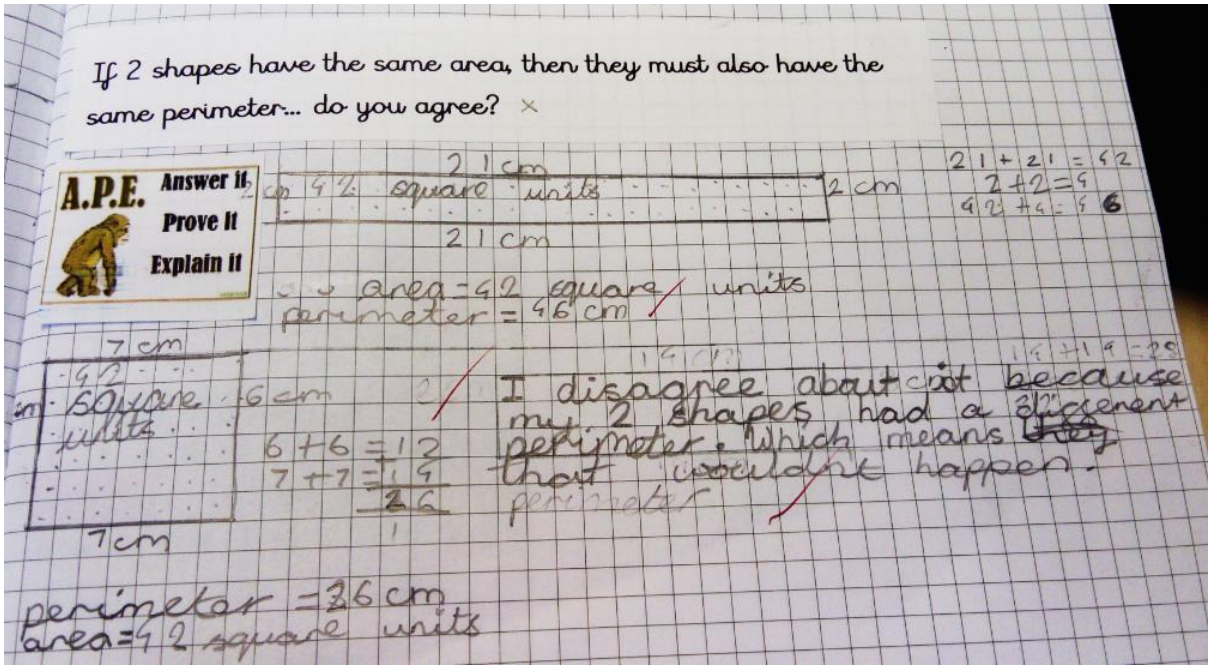
Reasoning expectation:

Reasoning should be recorded regularly in books for years 2 to 6 and children should be given opportunities to record reasoning during each unit of study.

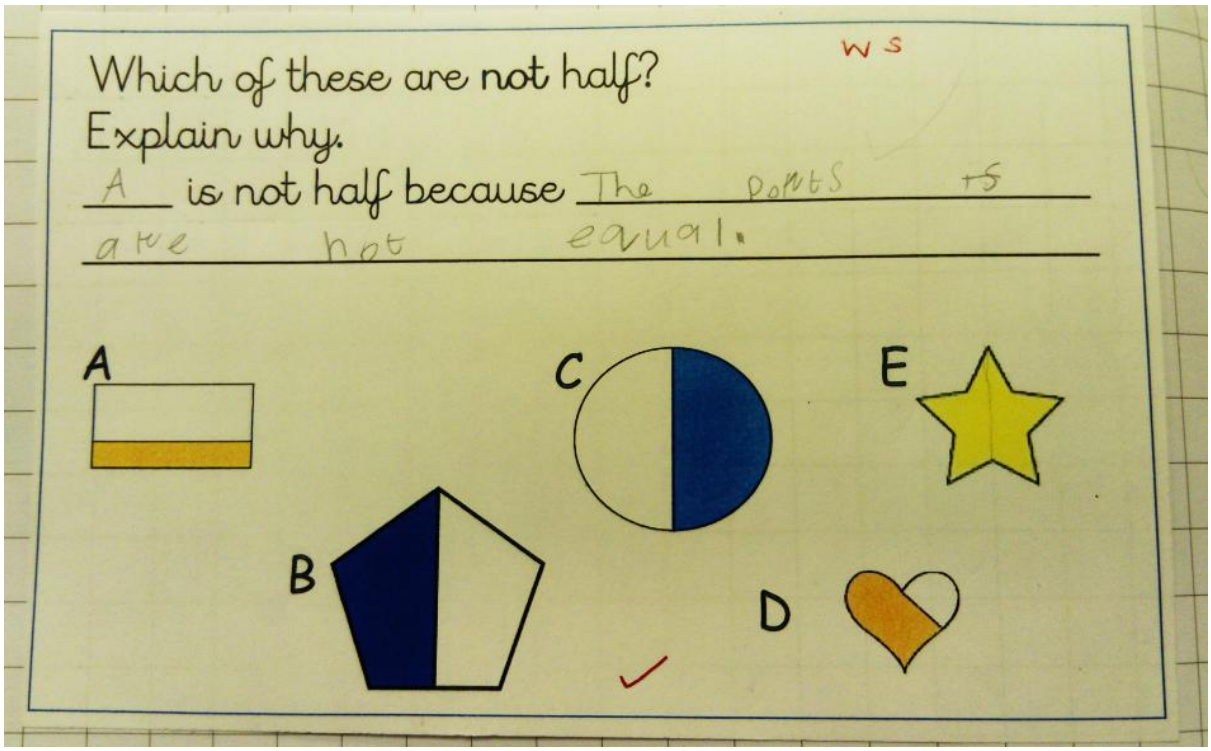
EYFS and Year 1 will undertake reasoning activities but these are likely to be completed verbally by most children. However, children who are capable of recording should be encouraged to do so.

The above expectation is for children recording in books but there should opportunities to reason verbally in class on a daily basis during inputs, class discussions and plenaries. Effective practice is for the teacher to model how to use APE at these times to ensure children are exposed to good practice frequently.


Which has more money? Prove it?
5p
2p
1p
1p
1p
1p
1p
A: Blue
P: 5+2 = 7
1 + 1 + 1 + 1 + 1 + 1 = 6
E: I know this because the value of the blue box is more than the red.


If 2 shapes have the same area, then they must also have the same perimeter... do you agree?
A.P.E.
Answer it
Prove it
Explain it
21 cm
square units
2 cm
21 cm
area = 42 square units
perimeter = 46 cm
21 + 21 = 42
2 + 2 = 4
42 + 4 = 46
7 cm
square units
6 cm
7 cm
6 + 6 = 12
7 + 7 = 14
26
I disagree about it because my 2 shapes had a different perimeter. Which means that it couldn't happen.
perimeter = 26 cm
area = 42 square units

An example of how reasoning maybe recorded for children in lower KS1



TEACHERS' PLANNING AND ORGANISATION

Each class teacher is responsible for the mathematics in their class in consultation with, and with guidance from the school maths lead and the EYFS leader.

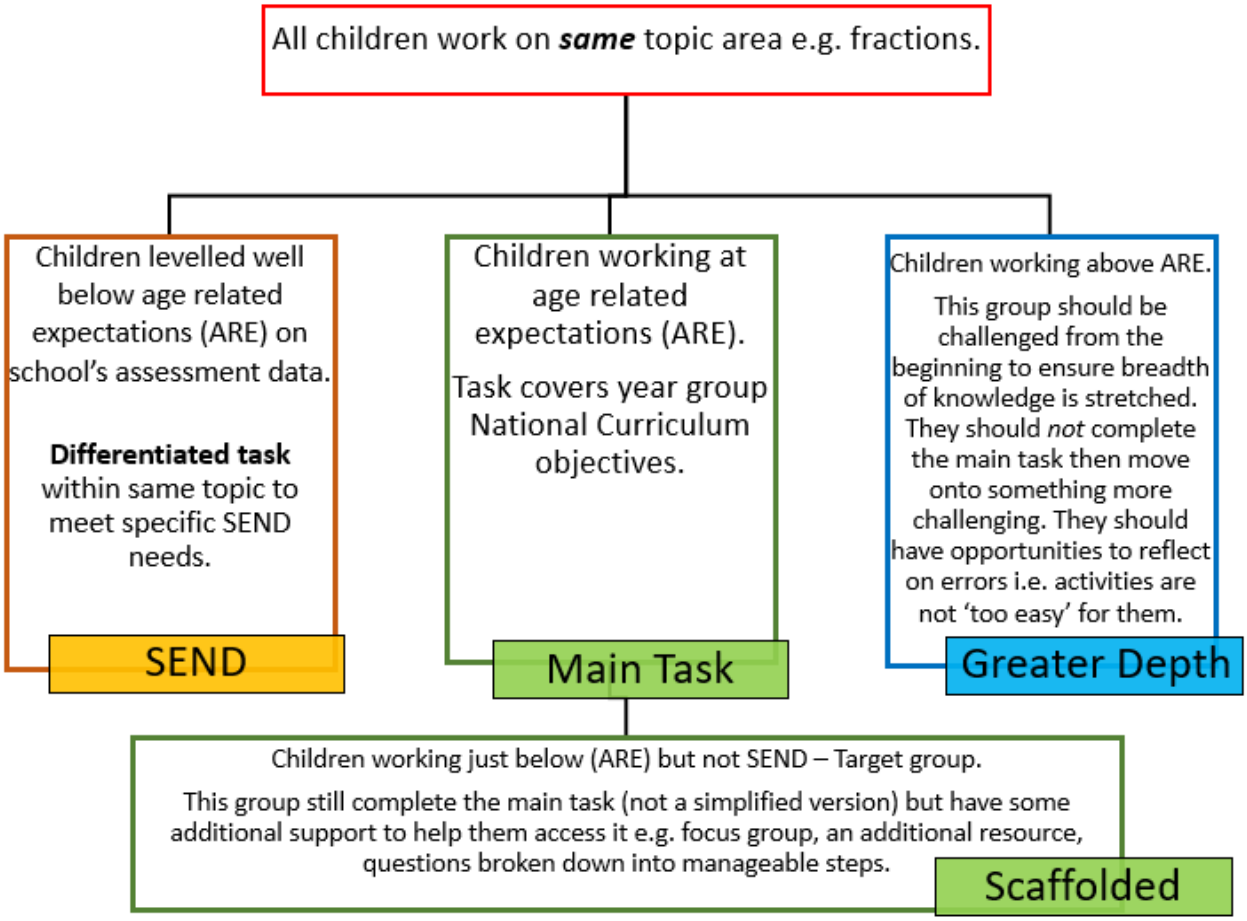
The approach to the teaching of mathematics within the school is based on the following principles:

- a mathematics lesson every day.
- an emphasis on mental calculation.
- a clear focus on direct, instructional teaching and interactive oral work with the whole class or group.
- key mathematical vocabulary on display during every lesson which children refer to and use when communicating their ideas using full sentences.
- opportunities for children to reflect upon their learning.

Teachers of the Reception classes base their teaching on objectives in Development Matters; this ensures that they are working towards the 'Early Learning Goals For Mathematical Development'. Towards the end of Reception, teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1, they are familiar with a longer, more focused lesson.

DIFFERENTIATION & SCAFFOLDING

The needs of individuals and groups should be carefully considered in all mathematics lessons. However, children are expected to move at broadly the same pace across each key stage.
Planning should indicate the main activity based on age related expectations from the National Curriculum objectives and differentiation/scaffolding will be achieved accordingly.



Ideally, intervention / booster groups for children who have not grasped key concepts (but not on the SEND register) should also run on an ongoing basis. These sessions will follow the topics studied each week in daily maths lessons and serve as pre-teaching, a booster or catch-up programme to support children in a timely, personalised manner. Each session will not necessarily involve the same children and teachers will need to be aware of who needs additional support each week as some children may be more confident in some areas of the curriculum but not so in others.

SPECIAL EDUCATIONAL NEEDS

Children with SEND are taught within the daily mathematics lesson and are encouraged to take part in age related activities when possible (please see the section on differentiation). However, where this is not possible, a different activity within the same strand of maths must be provided.

Intervention groups for children with SEND will be organised by the SENCO and will take place outside of the daily maths lessons. These sessions will be guided by initial assessments to identify each child's strengths and areas for development.

GREATER DEPTH

Within the daily mathematics lesson, activities will be planned that provide appropriate challenges for children. Teachers should be aware of every pupil's individual talents within their class as there will be children who are more confident in one specific area of mathematics e.g. geometry. It is the teacher's responsibility to ensure that they are catered for.

This may be achieved by adding enrichment through a broader range of contexts, tasks and resources. Depth of knowledge and mastery of a concept is key and children should **not** be accelerated by tracking forward to future learning objectives within or across a key stage.

PUPILS' RECORDS OF THEIR WORK

There are occasions when it is both quick and convenient to carry out written calculations. It is also important to record aspects of mathematical investigations. Children are taught a variety of methods for recording their work and they are encouraged and helped to use the most appropriate and convenient method of recording.

Children are encouraged to use mental strategies before resorting to a written algorithm.

Exercise Books for Recording:

All children are encouraged to work tidily and neatly when recording their work and a pencil should be used. When using squared paper, one square should be used for each digit.

The school's presentation policy should be followed at all times.

KS1 are encouraged to write their own date and learning objective as soon as they are able to. However, this will not always be possible, especially at the start of KS1 so this may be printed and stuck into books or written by an adult (ensuring that the presentation policy is still followed).

Children are not required to draw a margin in maths books.

MARKING

Marking should be both diagnostic and summative and school policy believes that it is best done through conversation with the child but acknowledges that constraints of time do not always allow this.

Refer to mathematics section of the trust ***Feedback Policy*** for full guidance.

ASSESSMENT AND RECORD KEEPING

Teachers are expected to make regular assessment of each child's progress and to record these systematically. The following is the school policy for assessment in mathematics:

Formal Assessment and Gap Analysis:
During the school year, children are formally assessed as part of the School's Assessment Policy. Children will complete termly PUMA reasoning papers which result in standardised scores.
Reception completes a baseline assessment to indicate attainment on entry. This is also repeated on a termly basis to assess progress.

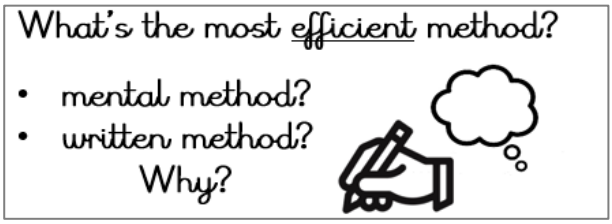
Termly gap analysis documents are completed after summative assessments during assessment week (see assessment calendar for timings).
Gap analysis will inform pupil progress meetings and provide teachers with strengths and areas for development for the class as a whole, specific groups of children and individual pupils.

Subsequent planning should reflect these outcomes, ensuring that it is tailored to meet the needs of each cohort.

Arithmetic (Daily calculations):
Sessions will be timetabled (ideally short daily sessions outside of the main maths lesson) for children to rehearse written calculations (arithmetic) at an age-appropriate level.
The three main areas children will practise during the sessions are:

- Addition and subtraction
- Multiplication and division
- Fraction calculations (these should be included within the above sections e.g., addition of fractions).

As with mental maths sessions, calculations are self-marked and teachers should focus on enabling high quality discussions regarding the methods used, highlighting efficiency.



Initially, Year 1 will use these sessions to rehearse key facts e.g., number bonds with an oral/mental focus. They will progress to number sentences using addition and subtraction during the year but there are no formal requirements for written multiplication and division at this stage.

An open-ended question should be displayed for 'fast finishers' to explore ensuring that their time is not wasted waiting for others. Examples of this might include: 'How many numbers can you find with exactly 6 factors?'

REPORTING TO PARENTS

Reports are completed termly and also in more depth before the end of the summer term and parents are given opportunities to discuss their child's progress at parents' evenings.

Teachers use the information gathered from their assessments to help them comment on individual children's progress.

Parents may also make appointments to speak to teachers at any time during the school year in order to discuss their child's progress and, if necessary, will be welcomed into school to work alongside teachers during mathematics lessons.

STAFFING AND RESOURCES

Development of Staff:

Opportunities for teachers to review the scheme, policy and published materials are given during staff meetings and INSET sessions. These sessions will also be used in order to inform staff of any key developments within the curriculum and to provide training opportunities for teachers to discuss and improve their practice. Additional training sessions for individuals may also be organised by other outside agencies.
Staff should receive opportunities to observe practice in other classes. These may take the form of peer-to-peer observations, team teaching or model lessons run by school maths leads or more experienced colleagues.

Practical Resources:

All teachers should organise an area within the classroom dedicated to everyday mathematics resources such as hundred squares, number lines and bead strings.
To be effective, resources should:

- be well organised, easily accessible and clearly labelled so children may select items as required.
- allow 'concrete' learning experiences through practical, investigative and multi-sensory approaches including ICT.

HOMEWORK

It is school policy to provide parents and carers with opportunities to work with their children at home. These activities may only be brief, but are valuable in promoting children's learning in mathematics. See individual school's 'Homework Policy' for further guidance.