

ARTHUR BUGLER SCHOOLS



Mathematics Policy

Review Date	October 2014
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Date	Amendment Details
24.4.12	Whole New Policy developed
23.7.12	Update to monitoring details
25.9.13	Whole Policy Update
10.10.13	Amend with KS1 and EY

Arthur Bugler Schools

Aims for Mathematics

The schools aims for the teaching of mathematics are:

1. To establish firm foundations on which mathematical concepts are embedded and built upon.
2. To actively engage the children in the process of learning about mathematics, in order that they will develop a positive interest in the subject.
3. To assist the children to develop systematic methods of recording mathematical activities and data.
4. To develop the children's ability to communicate their mathematical ideas in speech and writing, using appropriate mathematical vocabulary and symbols.
5. To enable children to develop the fundamental skills of mathematics.
6. To enable children to understand the links between mathematics and other subjects, and recognise the relevance of using and applying mathematical skills to the real world and in everyday situations.
7. To give pupils the opportunity to apply their mathematical knowledge in a range of contexts - mathematical reasoning, communication and problem solving.
8. To develop the children's skills of computation and their ability to use and apply basic mathematical rules, through a process of practice and revision.
9. To enable the children to develop logical strategies which they will be able to apply to the solution of the mathematical problem.
10. To develop the children's ability to investigate open-ended mathematical tasks or problems using a systematic and enquiry based approach.

Objectives

See appendix B for further details about the objectives.

Early Years

The objectives in the mathematics curriculum are divided into 2 areas of learning. Pupils are expected to be at the early learning goal by the end of the year.

The two areas are:

Numbers

Shape, Space and Measures

Key Stage 1 and 2

The objectives in the mathematics curriculum are divided into 4 MA focus areas of learning,

In Key Stage 1 the teaching blocks are currently based on the revised numeracy framework.

Within Key Stage 2, the teaching blocks are based on the four focus areas 3 of which are taught in teaching blocks throughout each term, with MA1 being revisited consistently throughout all blocks. The blocks are sequenced and frequency determined in accordance with the long term plan for each year group.

The four MA focus areas are:

MA1 – Using and Applying

MA2 – Number

MA3 – Shape, Space and Measures

MA4 – Handling Data

The Mathematics Curriculum will be delivered through daily Numeracy Lessons, and also through any other cross-curricular links, which occur during the course of the year, including those in ICT.

Curriculum 2014

As of January 2014 Key Stage 1 and 2 will begin implementation of the new curriculum for years 1 – 5.

The new curriculum is based on the following focus areas:

- Number
- Measurement
- Geometry
- Statistics (only from Year 2)

Methodology

Effective mathematics teaching should utilise a variety of styles, as appropriate to the subject or specific objective.

- a) A clear teaching sequence and pace.
- b) Modelling by the teacher.
- c) Discussion between the teacher and the pupils and between pupils.
- d) Practical activities, with regular opportunities to use hands on resources.
- e) Consolidation and practice of skills and methods.
- f) Application of skills and methods to problems involving everyday situations.
- g) Open-ended investigative work, exploring mathematical problems on a regular basis.
- h) Solving problems mentally using a variety of strategies to simplify the process, through weekly mental maths tests.
- i) Demonstrating how maths is used in practical situations.
- j) Providing the children with regular opportunities to extend their learning and to challenge themselves.
- k) Provide children with clearly differentiated tasks, specifically pitched to the needs of the children as taken from on-going assessments.

Continuity and Progression

All teachers are encouraged to make Numeracy lessons fun, engaging and challenging for the children to move children's knowledge and understanding forward. The use of practical resources to stimulate children's learning is encouraged. Planning and book looks will be completed on a regular basis to ensure that the pitch of the lesson is appropriate to the needs for the pupils.

Early Years

In Early Years the planning objectives are taken from the Developmental Matters and Early Learning Goals documents.

Key Stage 1

In Key Stage 1 planning objectives are taken from the new framework and are incorporated into planning. Activities are then developed to meet the needs of individual pupils.

Key Stage 2

The school encourages teachers to teach to the needs of the children within their classes/set. In Key Stage 2 teachers are able to use a range of schemes such as Collins Primary Maths and Abacus Evolve to support their planning and to find resources. In order to ensure all pupils are working to an appropriate level each will be given sublevelled target ladders identifying their present sub-level and that that they are aiming for next.

All children will take part in a weekly mental maths test to improve their basic understanding, this will then be followed by a discussion about different areas where pupils need to focus and strategies that can be used to help pupils progress.

Extending the Children's Mathematical Language

It is particularly important that pupils should be given adequate opportunities to develop the language of mathematics appropriate to their ability and age. Focused discussion and talk, guided by the teacher, should be encouraged within the classroom, as well as in small group situations. By this means the correct vocabulary will be reinforced. Each classroom should have a 'Working Wall' where relevant vocabulary is displayed and key concepts around each topic are highlighted.

Children's attention should be focused to the 'Working Wall' regularly throughout the lesson and over the course of a teaching sequence. We understand the importance of ensuring that teachers are aware of any implications that the use of language could cause such as explaining multiplication as groups and lots of.

Learning through Practical Experience

It is a long established principle of primary teaching that children's learning is secured by practical experience and involvement. It is therefore important that children are provided with practical activities and opportunities for using apparatus in a hands-on manner, in order to support their understanding. A high emphasis will be placed on engaging the children and motivating them to learn through the use of games, physical activities and challenges during weekly maths lessons. It is agreed that children find retaining information easier if they have memorable experiences to attach their learning to. This is particularly significant within the Early Years where most activities are practically based to provide a secure understanding for future learning.

In number work, it is expected that children will commit to memory basic key facts according to ability including multiplication tables and number bonds. Opportunity should be provided to enable the children to develop their recall of these facts, through the use of weekly tests and through mental oral starters.

The children will be encouraged to set work out methodically, clearly and tidily. The same level of care being applied to writing numbers as to letters, and with careful use of straight-edges or rulers for drawing lines and diagrams.

Equal Opportunities

All children have equal access to the curriculum regardless of their gender, culture, race and ethnicity. This is monitored by analysing pupil performance throughout the schools to ensure that there is no inconsistency between groups. We incorporate mathematics into a wide range of cross curricular subjects and seek to take advantage of multicultural aspects of mathematics e.g. Islamic patterns in RE. Differentiated activities suited to individual; levels of development and supported resources and expertise will be provided. IEP targets are also appropriate for some children.

Inclusion

All pupils are included in the daily mathematics lessons and have experience of direct, interactive and lively teaching appropriate for their age and stage of development. During mental and oral activities, teachers use a mixture of questions directed at the whole class and some questions pitched specifically at particular groups or individuals within the class, in order to ensure the involvement of all pupils. Teachers leave sufficient "thinking time" after questions and use a balance of open and closed questions. During the main teaching activity, teachers plan activities, which are differentiated around a single mathematical objective. Across each week all pupils have the opportunity to discuss their learning during the plenary.

Cross-Curricular links

Teachers are constantly encouraged to promote mathematics across the curriculum, where relevant. This will enable pupils to understand that mathematics is a large part of everyday life and allow them to apply skills that they have been taught previously into a real-life context. During each academic year, one week will be devoted to 'Maths Week', where teachers are encouraged to develop creative and cross-curricular maths experiences for the children to inspire them, whilst developing their mathematical thinking and problem-solving skills.

Assessment and Marking in Early Years

In the Early Years, assessments are made based on a range of observations from adult-led and child initiated activities. When work is produced the Key Stage 1 marking policy applies and will be used as evidence. The majority of feedback is verbal and instant to ensure that pupils know what they have succeeded at and what they might do next. Teacher assessments are ongoing but will be formally reported each half term. Children are assessed against the age bands from the Development Matters document, however the formal assessments are made at the end of the year based on the Early Learning Goals. Children will be classified as emerging, expected or exceeding the goals.

Assessment and Marking in Key Stages 1 and 2

Teachers should continuously assess children's work throughout the year in order to ensure that the children are making good progress in the development of their knowledge and skills. Marking should be prompt, thorough and should following the marking policy in place within the schools. Children should be given regular 'Next Steps' to correct areas of misconception or to move their learning forward to the next level. Children should be regularly provided with opportunities to move their learning on in their Next Steps by being set an activity to consolidate their learning, correct misconceptions or to move their learning forward. Where any areas of difficulty are noted with individual pupils, such weaknesses should be used to inform future planning for mathematical teaching, and to structure appropriate reinforcement activities to ensure progress. Children who find key concepts difficult can be selected to receive additional intervention so that

they can work in a small group to correct problems and give them security to answer similar questions in the future. Careful assessment will also identify any children who are not being challenged. Extension work can be planned for this group. Children should be regularly provided with challenges to extend their thinking and move their learning forward.

All children in the schools are teacher assessed on a half-termly basis – taking into account independent work completed and based on the school levelling/ target ladder objectives and in conjunction with the APP document. During the Spring and Summer term, children are formally tested on their understanding. Year 2 will complete past SAT's papers, while years 3, 4 and 5 will complete past QCA papers. Year 6 will complete past SAT's papers as revision practice and to monitor their understanding of key topics. Year 6 will undertake these formally three times throughout the year. The results of any completed assessments are added to the children's cumulative records and provide evidence of achievement and progress to the child's successive teachers, although these results should not be the main judgement made relating to pupils progress. These results will be used to inform future target setting.

Children will be given individual targets or group targets on a regular basis) to work through in their lessons. Children will be set targets that are appropriate to their level of work, in order to move their learning forward. Ongoing assessments of these targets should be made and targets should be dated and reviewed when they have been achieved. Targets will be taken from relevant assessment documents.

Homework in Key Stages 1 and 2

Children will be set a written piece of homework on a regular basis (weekly for KS1 and fortnightly for KS2). In Key Stage 2, children who do not complete the homework at home will be given a warning (unless in year 6) and should then return homework the following day. Where homework is not returned after a verbal warning, pupils will be expected to stay in and complete homework at lunchtime. Homework should be marked in accordance with the school marking and feedback policy (using the three tick system as a minimum). Children at Key Stage 2 will be set a times table target and will be expected to learn these at home. These will be tested on a weekly basis during numeracy lessons.

Supporting Learning

In lessons all groups of pupil will have regular opportunities for adult guidance from both LSA's and classteachers. Where necessary additional learning is supported by a range of intervention sessions, lead by the LSA's/ HLTA's, class teacher's or other staff within the schools. Current interventions can be sourced from the Inclusion Team.

Resources

Some apparatus required on a daily basis is held within the classrooms. The majority of the maths resources are stored in a central resources room. The Numeracy Subject Leaders will continually review the resources held in store cupboard in order to provide the necessary, cost-effective equipment to deliver the Mathematics curriculum effectively. Each classroom is equipped with an Interactive White Board which will provide interactive resources for the children to come and work on in whole class teaching. Teachers have access to Testbase and are encouraged to regularly provide children with opportunities to apply their understanding to a range of questions, in order to familiarise themselves with the language and layout of these. The schools have the use of the computers in the ICT suites, laptops and iPads. Teachers are actively encouraged to use these to support the children's learning. Teachers are encouraged to be imaginative in their use of resources, by using all available learning environments. Children need to be provided with models

and images to support their learning. Teachers should be using their working walls to support the children in their learning on a daily basis.

Critical Success Factors

The schools mathematics programme will be successful if there is evidence of the following factors:

- Increased competency and accuracy in computations involving the four operations of number and measurement.
- Increased understanding and use of mathematical symbolism and terminology.
- Increased knowledge of mathematical facts and processes.
- Increased ability to handle mathematical problems and investigations involving application of a wider range of basic skills.
- Improved presentation of work including graphic representation.
- Increased enthusiasm for maths within the schools, both for the teaching staff and for the children.
- An increased number of children meeting their age related expectations.
- An improvement in our attainment at the end of each year groups.

Review

The mathematics policy is subject to annual audit and review in order to initiate change or modification if required. The need for further resource requirements will also be considered on an on-going basis.

Staff Development

Staff development will be monitored and training will be given, where necessary, on a regular basis to meet the needs of the staff as they arrive.

Parental Involvement

There will be regular opportunities throughout the year for parents to be involved in workshops to enable them to support their children's learning. Parent voice is also taken into consideration through the annual parent questionnaire and termly parent forums.

Reporting to Parents

Parents are invited on several occasions throughout the school year to discuss progress and targets with teachers and to review the work in their child's books.

Early Years and Key Stage 1

Parents have the opportunity to attend 'Open Door Thursday' on a weekly basis where they can look at examples of work and informally discuss any issues or concerns with the class teacher. Formal arrangements are made to meet with the parents once per term.

Key stage 2

Parents are always welcome to make appointments to discuss concerns with the class teacher, but formal arrangements are in place for them to attend throughout the year.

Autumn Term - Termly Learning Conference and Class Tea

Spring Term - Termly Learning Conference and Class Tea

Summer Term - Written Report and Class Tea

Parents from both Key Stages also receive a written report at the end of the summer term detailing areas of strength and weakness, based on the Early Learning Goals/National Curriculum level descriptors, progress made throughout the year and where their child lies in relation to age-related expectation.

The Governing Body

The current Numeracy Governors are Sue Stubley and David Geddes They are regularly updated with any changes to the curriculum or teaching of Mathematics and are invited to visit classes during maths week and on other occasions throughout the year.

Appendix A

Numeracy Codes for marking pupils' work for staff and LSAs.

*	show success achieved (or work highlighted in green)
T	show next steps (or work highlighted in orange)
Sp	spelling error, pupil to replace mis-spelt word with correction
F	work finished to this point
N	notes written by pupil
M	mind map
H	work completed with HLTA
S	work completed with a supply teacher
V	verbal feedback given to pupil
WS(T)	individual work carried out with LSA or teacher
WS/G	group work carried out with LSA
GG	guided group work with a teacher
?	challenge or correction
☺	from one to three ticks to indicate increasing success
R A G	pupil self-assessment for rate of success during a lesson

Appendix B

Early Years

Numbers

Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

Shape, space and measures

Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them.

Key stage 1 and 2

Using and applying mathematics

Our objectives in developing the children's ability to use and apply mathematics will be to:

- Use maths in everyday contexts, so that the children can see the relevance of maths in the wider world.
- Encourage children to transfer skills from the classroom.
- Solve problems by using existing knowledge from the other strands of maths and be able to discuss their method and findings.
- Develop children's ability to select appropriate processes to solve problems.
- Ensure that children have developed an understanding of technical mathematical vocabulary and everyday terms.
- To develop and investigative techniques such as: the ability to predict, the ability to apply tests, the ability to look for patterns and the ability to generalise.

Number

As the largest area of mathematics, number has been categorised into the following sections.

Counting and understanding number

Our objectives in developing the children's ability in counting and understanding number will be to:

- Ensure that children have an understanding of the sequencing of numbers.
- Ensure that children are able to state the value of any given number.
- Enable children to count on or back from any given number in any given amount.

Knowing and using number facts

Our objectives in developing the children's ability in knowing and using number facts will be to:

- To develop children's awareness of key facts about numbers and digits, for example, being able to identify prime numbers.
- To give children the ability to transfer knowledge of number facts into different problems, or situations.
- Develop children's understanding of key terms linked to number.

Calculating

Our objectives in developing the children's ability in calculating will be to:

- Give children an understanding of the four rules of number.
- Enable children to know when to use each rule of number.
- Ensure that they know that there is more than one method to answer a question.
- Allow children to be able to show their method clearly.
- Check to make sure that the children can be able to check their work for errors.
- Give children a range of methods to answer calculation questions, appropriate to their year group and ability.
- Extend children's understanding of the relationship between the four rules of number.
- Develop children's ability to know and recognise mathematical symbols linked to number.

Shape, Space and Measures

Understanding shape

Our objectives in developing the children's ability in understanding shape will be to:

- Develop the children's ability to recognise, sort and describe 2-D and 3-D shapes using appropriate terminology.
- Enable the children to construct 2-D and 3-D shapes with increasing accuracy.
- Enable the children to recognise rotational and reflexive symmetry.
- Enable the children to recognise, describe and carry out simple transformations in order to create patterns.
- Enable the children to recognise, construct and measure angles and understand their properties.
- Develop the children's understanding and use of co-ordinates in all four quadrants.

Measuring

Our objectives in developing the children's ability in measuring will be to:

- Enable children to select either standard or arbitrary methods for measuring.
- Enable the children to use language to compare measures (larger units, smaller units, taller, shorter) with increasing accuracy and to understand the way the different units relate to one another.
- Enable the children to select appropriate measuring instruments for particular tasks, and to use them with increasing accuracy and confidence.
- Encourage the children to make sensible estimates of measure in everyday situations.
- Enable the children to read and measure time.

- Develop the children's ability to accurately calculate the area of surfaces and the volume of spaces.
- Compare units of measure accurately.

Handling Data

Our objectives in developing the children's ability in handling data will be to:

- Enable the children to develop methods of sorting sets of objects according to their attributes, to describe the criteria for selection clearly and to record the information pictorially or diagrammatically.
- Enable the children to collect and record statistical data from everyday life situations, to interpret and analyse the data and to record the findings using graphs and diagrams.
- Develop the children's understanding of averages, to calculate averages and use them effectively in their work.
- Enable the children to use the computer to store data or information, and to know how to extract or represent data as required.
- Develop the children's knowledge and understanding of probability and of its associated language.
- Enable children to recognise and estimate degrees of certainty in relation to the concept of probability.
- Develop an understanding of mathematical language associated with data handling, such as mean, mode, median, range.
- Teach children how to find mean, mode, median and range from a set of data.

Problem solving, reasoning and maths

Our objectives in developing the children's ability in problem solving, reasoning and maths will be to:

- Understand what the question is asking
- Select an appropriate method to solve the problem
- Select appropriate apparatus to solve the problem
- Record their findings accurately
- Draw conclusions from patterns in their findings
- Make reasonable assumptions and predictions as a result of their findings.
- Use skills of estimating and prediction to check to see if their results are 'sensible'.