



## Mathematics Policy

### Introduction

At Holywell First School we believe that mathematics equips pupils with a uniquely powerful set of tools, through developing an ability to calculate, reason and solve problems. It enables children to understand and appreciate relationships and patterns in both number and space in their everyday lives. Through their growing knowledge and understanding, they also learn to appreciate the contribution made by many people to the development and application of mathematics.

### **This revised policy takes into account the new National Curriculum (2014)**

It should be read in conjunction with the following school policies:

- Written Methods Calculation Policy
- Basic Skills Policy
- Maths Teaching and Learning Profile
- Assessment for Learning and Marking Policy

### Purposes

It is our aim to:

- 1) To develop lively, enquiring minds encouraging pupils to become self-motivated and confident through growth mindset
- 2) Create problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics
- 3) To promote understanding, skills and logical thinking.
- 4) To ensure there is dedicated daily maths lessons, which teaches the requirements of the new National Curriculum
- 5) To secure high standards through effective teaching and learning throughout the school.
- 6) To establish clear, realistic targets for raising standards and to provide a manageable plan for achieving them.
- 7) To enable children to calculate accurately and efficiently both mentally and with pencil and paper using a range of strategies.
- 8) To develop an awareness of mathematics in the environment and in everyday situations and to use and apply mathematics across the whole curriculum using mathematical terms.
- 9) Enable the subject leader to review, monitor and evaluate the planning, teaching and assessment of mathematics throughout the school.
- 10) An ability to communicate using mathematical language
- 11) Promote a growth mindset about children's ability to learn mathematics

### Aims of the new National Curriculum

Ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can **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.

## **School Curriculum - Programme of Study**

### **Foundation Stage**

The programme of study for the Foundation stage is set out in the EYFS Framework. Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shape, spaces and measures.

### **Key Stage 1 and 2**

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

### **Key Stage 1**

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

### **Lower Key Stage 2**

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.

At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

## **Teaching and Learning**

### **Teachers' planning and organisation**

We teach the programmes of study using a mastery approach, which ensures continuity and progression in the teaching of mathematics. Within a unit of work, the time spent on teaching a specific learning objective or set of learning objectives depends on the needs of the children.

Lessons follow the 5 principles for mastery teaching

- 1) Coherence (The small progressive step journey which the learning takes)
- 2) Representation and Structure ( Children will have access to a range of concrete equipment (manipulatives) before moving on to a visual and abstract representation)
- 3) Fluency ( All children will be given time to practice fluency)

- 4) Mathematical Thinking (All children will have the opportunity to solve problems, make connections and reason within a lesson)
- 5) Variation (How questions and problems are shown and varied so that they progressively deepen children's understanding)

All teachers plan daily mathematics lessons following this structure using an agreed planning format. Planning is usually created on a weekly basis.

Planning includes the learning objective, key vocabulary possible misconception, what concrete manipulative and pictorial and abstract representations will be used, the teacher input and a Fluency, Greater Depth (Problem Solving) and Captain Challenge (Reasoning) activity to complete independently.

Where possible, using pre-assessment data, teachers pre-empt 'big' misconceptions that the children will have – e.g. a rectangle/oblong has four lines of symmetry (diagonals). Teachers also plan which vocabulary they will use and which models, images and concrete resources they will use to aid learning.

Effective plenaries are only part-planned as misconceptions arise during the teaching of the lesson. However, all plenaries refer to the learning outcome in a meaningful way, allowing the children some time for self-assessment. We ensure that across each term children are given a range of experiences in mathematics lessons e.g. practical activities and mathematical games, group problem solving activities, individual, group and whole class discussion activities, open and closed tasks.

We ensure that children can use a range of methods to calculate and have the ability to check whether their chosen methods are appropriate, reliable and efficient.

### **A Typical Lesson**

A typical lesson in Years 1 to 4 will have the following components:

- Daily Hi 5 Maths session, either before or away from the mathematics lesson which focuses on five key skills. See Basic Skills Policy
- Main teaching session which lasts approximately 40 minutes and uses the five mastery principles

The main teaching session will include both teaching input and pupil activities and a balance between whole class, guided group and independent work, (groups, pairs and individual work) effectively offering appropriate challenge. Sometimes the focus for this session is new learning, at other times pupils may be practising, to master the application of a concept they have learned earlier. The focus of this session may vary for different children depending on their learning needs

### **Differentiation**

Our staff have high expectations of all children, irrespective of ability, and encourage them to be successful and achieve their full potential. Our aim is to ensure challenge for all.

Children are encouraged to have a growth mindset about their ability to do mathematics. Encouraging children to 'have a go' is seen as paramount. We aim to develop the mantra that: 'it's okay to be stuck because it is fantastic when you get unstuck!'

Differentiation of tasks is done in various ways:

- ☑ Open ended questioning and activities which allow children to link their learning and reason
- ☑ Recording e.g. allowing some children to give verbal responses and photographing their learning
- ☑ Resourcing e.g. Use of concrete equipment such as Numicon, cubes, 100 squares, number lines, mirrors to support some children
- ☑ Groupings are of mixed attainment and are not fixed

Part of the independent work often involves some focused, targeted group work from the teacher. However groupings are 'fluid and flexible' based on the children's performance in a previous lesson or the beginning of that particular lesson.

Where Learning Support Assistants are available, they are fully briefed before the lesson and use the same teaching methods modelled by the teacher to support individuals or groups. This is either done verbally or is written down on the teachers planning.

### **Guidelines**

- 1) Children should be provided with a variety of practical experiences related to number and place value, addition and subtraction, multiplication and division, Fractions (including decimals), measurement, geometry: properties of shapes and statistics.
- 2) Children should be provided with a daily variety of experiences to develop mental and recorded skills in numeracy with and without counting aids, standard and non standard measures, 2D and 3D shapes and to collect, handle and interpret data.
- 3) Children should experience activities, which promote an understanding of the concepts of each Key Performance Indicator (number and place value, addition and subtraction, multiplication and division, Fractions (including decimals), measurement, geometry: properties of shapes and statistics.).
- 4) Investigation, estimation and discovery should be developed through ensuring sound understanding of number operations.
- 5) During the Hi 5 sessions, mental maths strategies, games and practical activities will help support the teaching of basic skills and the understanding of mathematical principles and vocabulary.
- 6) Children should be given the opportunity to collaborate and discuss mathematical activities and to use a variety of practical applications throughout the whole of their work. A wide variety of apparatus, activities and challenges will be used to extend confidence and understanding in using and applying maths.
- 7) Planning will be based upon the new National Curriculum (2014). Programmes of Study inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate activities. Although planned in advance they are adjusted in light of daily assessments. Where appropriate, maths will be taught through a creative curriculum approach. Assessment information using the 'Maths Smalls Steps Progression' document will be used to inform planning so that lessons are pitched at the children's individual levels, use differentiation and include an element of 'challenge' which is the children's next steps in their learning.
- 8) Termly pupil progress meetings will be held by the Senior Leadership Team with class teachers to track the progress of individual children and groups of learners. Children who are not making expected progress will be referred to the schools intervention manager.
- 9) The school actively works to narrow the gap between pupils in receipt of pupil premium and those that do not. This is done through a number of strategies:
  - Planned high quality teacher led interactions and interventions
  - The attainment and progress of pupils in receipt of Pupil Premium will be closely monitored by the class teacher who will complete a half termly Pupil Premium tracker sheet that is submitted to the Head teacher.
  - This will be used at termly pupil progress meetings with the Senior Leadership Team who discuss attainment and progress.
  - Interventions and extra support/resources will be directed as required.
  - When marking work, the class teacher will set marking challenges which are challenging next steps. (see marking policy)
- 10) The maths subject leader will monitor resources, effectiveness of planning, staff in need of in-service support, the effectiveness of agreed assessment procedures and use of the schools calculation policy and work with partnership First and Middle Schools as part of the assessment group.
- 11) The maths coordinator will work alongside the Interventions manager to direct intervention programmes such as Numicon and Dyscalculia. This will be reviewed half termly and the progress of children who have received this will be tracked.

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