**Pendragon Primary School**
**Mathematics curriculum**

**Overview**
We use a mastery approach, teaching the whole class together; using Herts for learning sequences to aid planning.
In addition to the daily maths lesson pupils engage in number talks and KIRFs practice**.**

**Aims of maths-National Curriculum**
**Fluency** 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.
**Reasoning** reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
**Problem solving** can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

**Areas of knowledge: Years 1 to 6**: Number and place value; Number addition and subtraction; Number-multiplication and division; Number-fractions (including decimals from **Y4**, percentages from **Y5**); Measurement; Geometry-properties of shape; Geometry-position and direction **From Y2**: Statistics **From Y6**: Ratio and proportion; Algebra

**Number sense**: We place high emphasis on pupils gaining number sense. **Number sense** enables a person to understand numbers and number relationships and to solve mathematical problems

- mental calculation
- computational estimation
- judging the relative magnitude of numbers
- recognising part-whole relationships and place value concepts
- problem solving

**Teachers and Teaching Assistants will:**

- provide opportunities for meaningful contexts
- provide concrete, pictorial and abstract examples to expose mathematical structure
- use a variety of representations
- scaffold and resource activities for inclusion so pupils '**keep up'** and all children can access the lesson
- address misconceptions
- insist specific vocabulary and stem sentences are used by pupils
- use pre or post teaching to enable all pupils to access the learning and **assign competence** to vulnerable leaners
- get pupils to 'talk, rehearse, teach someone else'

**Children will be taught how to:**

- gain specific knowledge and develop a deep understanding of each area
- be active, engaged, confident and resilient learners
- use specific vocabulary and stem sentences to reason and explain their thinking
- make mathematical connections
- build, say, draw, write mathematical representations
- be able to challenge and question
- be flexible thinkers and choose the most efficient method
- know their key facts (KIRFs)
- use equipment without stigmatisation

**Main Resources**

- National Curriculum
- Herts Learning Essential Maths Sequences
- Herts Essential Foundations for Counting
- Herts Progression in Mental Mathematics
- Herts Fluency slides
- Back on Track Maths (2020-2021-editable plans that integrate missed and insecure learning with priority focuses)
- Number Talks: Mental maths and computation. Fractions, decimals and percentages.
- Pendragon Calculation policy
- Outdoor learning
- Math's Eyes
- Number Blocks and Number Jacks
- Skills checks Continued practice (some year groups only)

**Weekly requirements**

- Daily maths lesson
- 3 short fluency sessions which could include number talks; the half termly KIRFS or work related to the current learning sequence
- At least two and up to 5 sessions of recap questions e.g. 4-a-day

**Guidance**

- Mathematics guidance KS1 and KS2 NCETM
- Herts Assessment and reactivation- Priorities and pathways 2020/21 only

**Assessment and retrieval**

- Destination questions-for end of unit, used 2 weeks after the learning sequence was completed
- Star Maths online assessment used 4 times a year for years 2-6
- Diagnostic tests-used before the learning sequence
- 4-a-day type questions

**Home learning**

- KIRFs (Key Instant Recall Facts) to support the learning of key facts in school and at home
- Mathletics
- Sumdog
- White Rose videos and resources in case of lockdown/bubble isolation
- Timestables Rock Stars
- Y1 and 2 number facts cards
- BBC Supermovers
- Purple Mash Monster multiplication

**Resources to support 1:1 or small groups- information for teachers and Teaching assistants**

- White Rose maths slides
- Power Maths
- Dyscalculia resources
- Success@arithmetic
- 1st Class @ number

- Available but not always in use

| Numbers by year | FS | Y1 | Y2 | Y3 | Y4 | Y5 | Y6 |
|---|---|---|---|---|---|---|---|
| **Number and place value** | Deep understanding of number to 10 | Read and write to 20 | Order and compare to 100 | Order and compare to 1,000 | Order and compare beyond 1,000 | Read write and order to 1,000, 000 | Read write and order to 10,000, 000 |
| **Counting** | Beyond 20<br><br>Five principles of counting | Count to and across 100 | Count in steps of 2,3,5,10 | Count in steps 4,8,50,100 | 6, 7, 9, 25 and 1000 | Count in powers of 10 to 1,000,000 | |
| **Multiplication tables** | | | 2, 5 and 10 | 3, 4 and 8 | up to 12 × 12 | | |

**Mathematics**

**ELG: Number**

Children at the expected level of development will:

- 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.

**ELG: Numerical Patterns**

Children at the expected level of development will:

- 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.

## Key stage 1 – years 1 and 2

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 [for example, 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 – years 3 and 4

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.

## Upper key stage 2 – years 5 and 6

The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.