
Mathematics



PORTSWOOD PRIMARY SCHOOL

KEY INFORMATION

Mathematics

Intent



At Portswood Primary Academy Trust, we strive for achievement for all our pupils and believe that all pupils should develop a passion for maths.

We want pupils to be **confident** in their use of maths; being able to **identify** where the **maths** is **in** the **problems** they are **faced** with, to prepare them for its use in the **real world** and to ensure that they are ready for the **next stage** of their **mathematics education**.

Our **aims** for maths, **reflect** the aims of the **National Curriculum**. Pupils should:

- Become **fluent** in the fundamentals of Maths
- **Reason mathematically**
- **Solve problems**

Pupils, at Portswood Primary School, should have a **secure knowledge of mathematical facts** and be able to **recall** them **rapidly**. Ensuring that pupils **retain** a **knowledge** of number, other mathematical facts or the processes of calculation, will mean they are **not a barrier to use in wider mathematics**.

Mathematics

Intent – Curriculum Content



What is taught, and the order that it is taught, is set out in the ***National Curriculum programme of study***.

This is reflected in the school's Long Term Planning (LTP) and in greater detail in the school's Medium Term Planning (MTP). ***LTP*** has been ***devised*** by ***Phase Leaders***, with the support of ***Curriculum leads***, and is ***reviewed annually***.

Adaptations to teaching content are ***made*** at the ***Short Term Planning (STP) stage*** based on on-going ***formative teacher assessment*** information.

STP and coverage are ***supported by non-negotiables*** for each area of maths, which highlight 'what should a pupil in year x be learning in concept y ?'.

These non negotiables also highlight ***what has previously been learned*** and allow to identify ***where learning*** will be ***taken next***.

Curriculum content is also supported by ***key milestone targets***, drawn up by teachers. 'What do I want to receive pupils being able to do?' These are reviewed annually and ***ensure*** that ***key skills*** at each point of learning are ***addressed***.

Mathematics

Implementation



Maths teaching should be supported by using a **concrete, pictorial, abstract** approach.



This allows for **secure retention** of key mathematical concepts. **Manipulative resources** should be available until a pupil is confident working with abstract concepts. They may be returned to at any time.

Significant numbers of EAL pupils, within the school, mean that these are an important component of maths teaching.

Retrieval practice should be built into teaching practice to ensure that **knowledge** taught **is retained**. This may be seen in **many different forms**. (Maths meetings in KS1, Last, Last, Last, Flashback 4, Remembering Time etc).

Rapid recall and securing **retention** of knowledge is also **supported** by **on-line** mathematics **software**.



Mathematics

Implementation



As pupils become **confident** using mathematic skills, they should be encouraged to **solve larger problems**, preferably when they will have to **combine** the **skills** from more than one mathematical concept. This is most prevalent in the final years of schooling.

Keeping up to date:

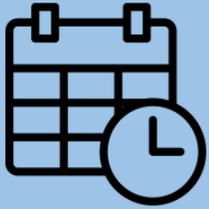
We aim to keep staff knowledge and subject leadership up to date through:

- **Engagement** with **Maths Hub** training and materials (both regional and national)
- Ensuring that **teaching staff** are **involved** in development work
- Sharing practice using **INSET** and **PDM** time.
- Keeping abreast of **pertinent mathematical publications** (in-print and on-line), including **EEF** guidance reports.
- Engaging in **teaching school** and **professional community work** across **MAT** schools .

(for more detail see: *Maths training and development schedule: teachers 2019-20/Maths*)

Teaching and Learning

Implementation



Mathematics is taught **each day** at Portswood Primary School.

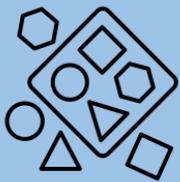
This should happen in the morning and pupils should receive at least **5 mathematics lessons per week**.



Teaching is **whole-class based**, supported by appropriate differentiation, for Y1 to Y4.

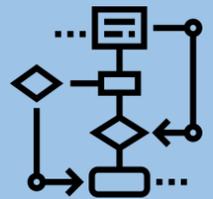


Due to the differing needs of pupils in **Upper Key Stage 2**, pupils will be **taught in ability groups**. Movement between these groups should be fluent.



In the **Early Years** stage, mathematics should be a **part of daily learning tasks**. This may be through Discovery Time, Star Jobs or as part of outdoor learning.

LTP, for maths, is created so that each **Programme of Study (POS)** component is **visited and revisited** throughout the course of the academic year. The LTP for each year group **covers the POS** as set out in the **Primary National Curriculum**.

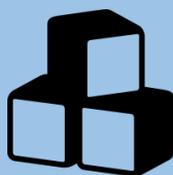
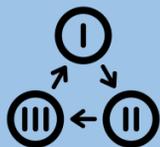


Pupils' progress through the POS follows National Curriculum advice: "The expectation is that the majority of pupils will move through the programmes of study at **broadly the same pace**."

Pupils who **grasp concepts rapidly** should be challenged through being offered **rich and sophisticated problems** before any acceleration through new content. Those who are **not sufficiently fluent** with earlier material should **consolidate their understanding**, including through additional **practice**, before moving on."

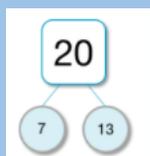
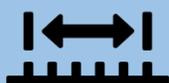
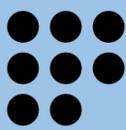
Teaching and Learning

Implementation – Key Milestones



Early Years

- Use **number language**, e.g. 'one', 'two', 'three', 'how many?'
- Developing understanding of **counting** in a number of different contexts/number order
- Model and encourage use of **mathematical language** and asking **mathematical questions**
- Help children to understand that one thing can be shared by number of pieces
- Use **number stories**, songs and rhymes, pictures and objects to illustrate counting
- Encourage children to use **mark-making** to support their thinking about numbers and simple problems.
- Demonstrate the **language for shape, position and measures** in discussions, e.g. 'shape', 'box', 'in', 'under', 'longest', 'short' etc
- Encourage children to **talk about the shapes** they see and use and how they are arranged and used in constructions.



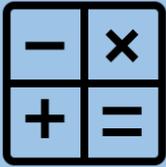
Key Stage 1

- **Confidence and mental fluency** with whole numbers, counting and place value.
- **Recognise, describe, draw, compare and sort** different shapes.
- **Describe and compare** different measures such as length, mass, capacity/volume, time and money.
- By the end of year 2, pupils should know the **number bonds to 20**.

There should be an emphasis on the **teaching and modelling** of appropriate **mathematical vocabulary** at all stages of teaching.

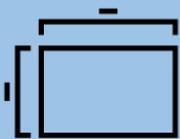
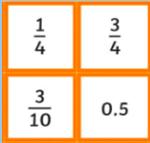
Teaching and Learning

Implementation – Key Milestones



Lower Key Stage 2

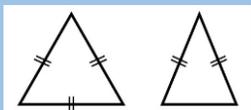
- Increasingly fluent with whole numbers and the four operations.
- Develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Solve a range of problems, including with simple fractions and decimal place value.
- Draw with increasing accuracy; Develop mathematical reasoning so they can analyse shapes and their properties
- Can use measuring instruments with accuracy
- By the end of year 4, pupils should know multiplication tables up to and including the 12



Upper Key Stage 2

- Extend understanding of the number system and place value to include larger integers. Develop connections between multiplication and division with fractions, decimals, percentages and ratio.
- Solve increasingly complex problems, using efficient written and mental methods of calculation.
- Classify shapes with increasingly complex geometric properties.
- By the end of year 6, be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

1000000



$$\begin{array}{r}
 15 \times 20 \\
 15 \times 8 \\
 \hline
 1 \ 5 \ \overline{) \ 4 \ 3 \ 2} \\
 \underline{3 \ 0 \ 0} \\
 1 \ 3 \ 2 \\
 \underline{1 \ 2 \ 0} \\
 1 \ 2 \\
 \hline
 \frac{12}{15} = \frac{4}{5}
 \end{array}$$

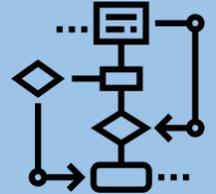
Teaching and Learning

Implementation – Teaching expectations



Maths lessons at Portswood Primary School are encouraged to include the following elements:

- Recall and revisiting previous learning (to develop fluency and confidence)
- Delivery of new content
- Shared ownership/modelling/guided group work
- Independent application
- Appropriate differentiation or support
- Challenge and extension tasks



Implementation – How effective is teaching in maths?

To ensure that teaching of mathematics is effective, the school monitors using the following approaches:

- A maths focus during school teaching and learning reviews. These are completed at whole school and teaching phase level.
- Coaching for teaching and support staff as part of ongoing CPD. This can be provided at planning or delivery stage to ensure all teaching staff receive the appropriate level of support to develop subject knowledge and teaching and learning strategies.
- Yearly moderation activity as part of continuous CPD.
- Termly standardised assessment tasks in Y2-Y6. The outcomes of these assessments tasks form part of the school's pupil progress program. These are used to inform pupil attainment and progress. Additional intervention and curriculum requirements are prioritised as part of this program.



Teaching and Learning

Impact – Quality of teaching



Reviews of Teaching and Learning in 2019-20 made the following observations about mathematics:

Early Years

In the teaching of Maths, in the Early Years, the use of concrete apparatus supported the concept of sharing/dividing. Teachers model and visually demonstrate which aids understanding.



Some pupils are able to explain their thinking and are developing early reasoning skills.

The use of open-ended questions gave some pupils the opportunity to explain their understanding in more depth.

Pupils have a range of different activities and resources to apply their knowledge independently.

Learning skills were explicit and language/rhyme reinforced the concept of sharing.

TAs are used effectively to support groups leading to greater progress. (February 2019)

Teaching and Learning

Impact – Quality of teaching



Key Stage One:

The phase is embracing the changes in maths teaching and this is deepening pupil understanding.

There is clear progress seen in maths books across the phase.

A range of visual representations are used to support the children's understanding in maths and to challenge their thinking.

Stem sentences are used in all ability books to support the use of mathematical language.

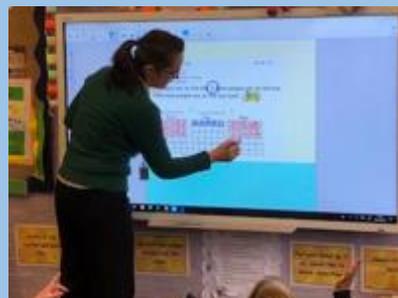
Children are encouraged to solve problems and apply reasoning using concrete, pictorial and visual representations.

Learning builds upon previous learning. Steps in learning are deliberately small to ensure concepts are understood.

The maths activities are presented logically for the pupils which leads to high level of engagement.

Teachers need to further develop conservation of number in the minds of pupils so they recognise small amounts quickly and can retain numbers in their head to count on from.

(February 2019)



Teaching and Learning

Impact – Quality of teaching



Lower Key Stage Two:

Mathematics is taught well in the phase. Changes over recent years have seen lessons include concrete, pictorial and abstract representation which aids understanding.

Pupils are busy in their learning. They are encouraged to use different methods for calculations.

Pupils are rightly encouraged to explain their methods because this deepens understanding.

Sequences of maths lesson are well planned and build upon the skills and knowledge of previous years.

Tasks are carefully chosen to meet the needs of learners including the most able.

Teachers adapt lessons based upon AfL and provide effective feedback including appropriate written feedback.

Pupils are highly motivated in maths.

(October 2019)



Teaching and Learning

Impact – Quality of teaching



Upper Key Stage Two:

The teaching of maths is exceptional. Pupils attain significantly above the national average.



Teachers use their deep subject knowledge to plan very effective learning experiences for pupils. They model and structure learning to help pupils learn very well.



Effective whole class teaching based upon strong subject knowledge contributes to pupils achieving well in maths.

Calculation strategies are taught through clear modelling which pupils are then able to apply independently. Misconceptions are used to 'unpick' learning.



Pupils take responsibility for their learning such as through selecting activities and self-marking.

Pupils are keen mathematicians who relish the challenge of solving problems and feel a sense of achievement when they are successful. They are resilient in achieving the success and can do so independently and with others.

(October 2019)

Teaching and Learning

Pupil Outcomes



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Teaching and Learning

Impact – Pupil Outcomes



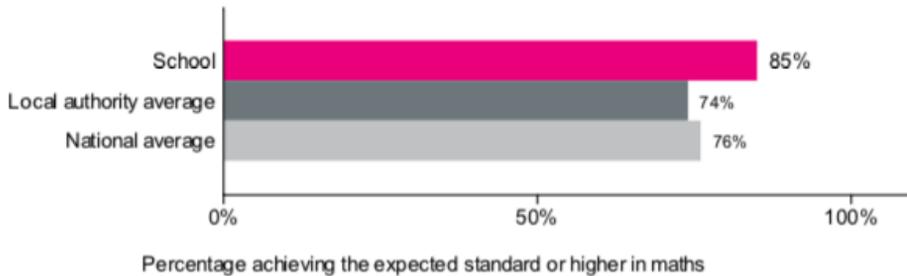
Early Years Foundation Stage: 2018-19

| Percentage of pupils achieving at least the expected level in each of the learning goals | | | | | | | | | | |
|--|---------------------------|------------|------------|------|--------|-----|---------|----------|-------------|--------|
| Areas of learning | Early learning goals | Breakdown | All pupils | Male | Female | FSM | Non-FSM | SEN EHCP | SEN support | No SEN |
| Maths | Numbers | School % | 86 | 84 | 89 | 67 | 89 | 100 | 40 | 91 |
| | Numbers | National % | 80 | 76 | 83 | 82 | 82 | 80 | 80 | 84 |
| | Shape, space and measures | School % | 90 | 87 | 93 | 67 | 92 | 100 | 40 | 94 |
| | Shape, space and measures | National % | 82 | 78 | 85 | 84 | 84 | 82 | 82 | 86 |

Key Stage One: 2018-19

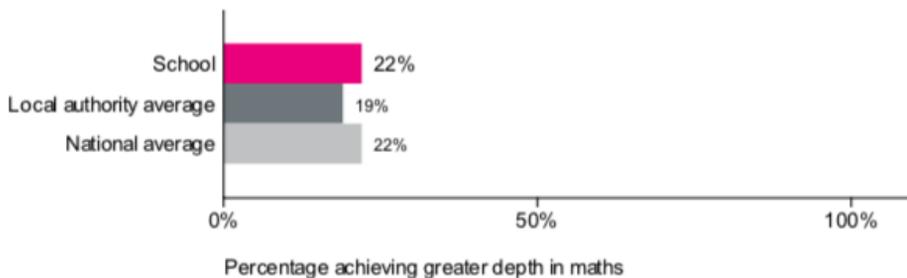
Percentage achieving the expected standard or higher in maths

Number of pupils = 59



Percentage achieving greater depth in maths

Number of pupils = 59



Teaching and Learning

Impact – Pupil Outcomes



Key Stage Two: 2017-19

Progress in maths

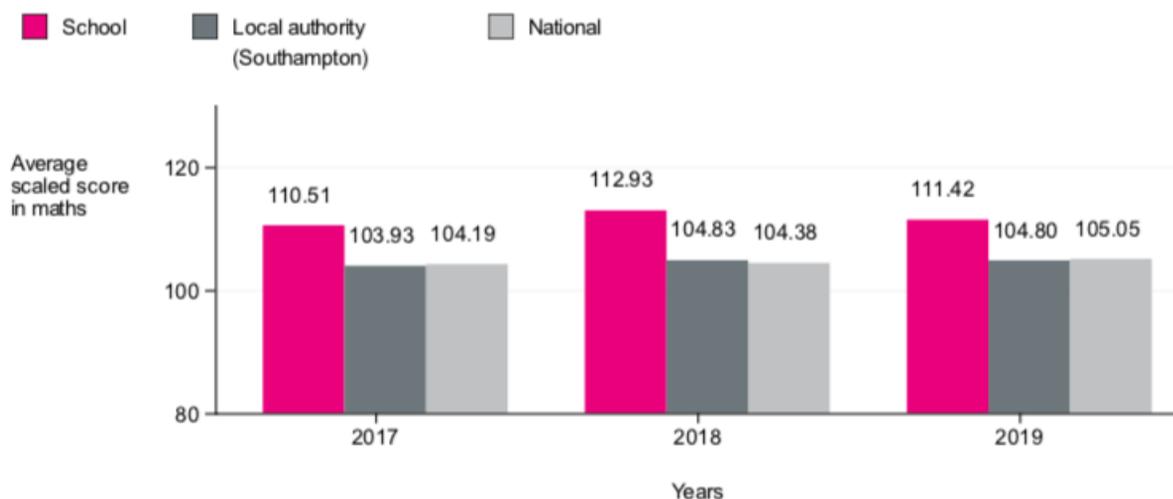
| | 2017 | 2018 | 2019 |
|-----------------------------|----------------------|----------------------|----------------------|
| Number of pupils | 51 | 55 | 58 |
| Pupils with adjusted scores | N/A | 0 | 1 |
| School progress score | 4.38 | 6.31 | 4.78 |
| Confidence interval | 2.9 to 5.9 | 4.9 to 7.7 | 3.4 to 6.2 |
| Progress banding | ■ Well above average | ■ Well above average | ■ Well above average |
| Local authority average | -0.43 | 0.67 | 0.05 |
| National average | 0.00 | 0.03 | 0.03 |

Average scaled score in: Maths

Number of pupils in 2017 = 57

Number of pupils in 2018 = 58

Number of pupils in 2019 = 60



Teaching and Learning

Impact – Pupil Outcomes



Key Stage Two: 2019

Mathematics

KS2 progress Guidance

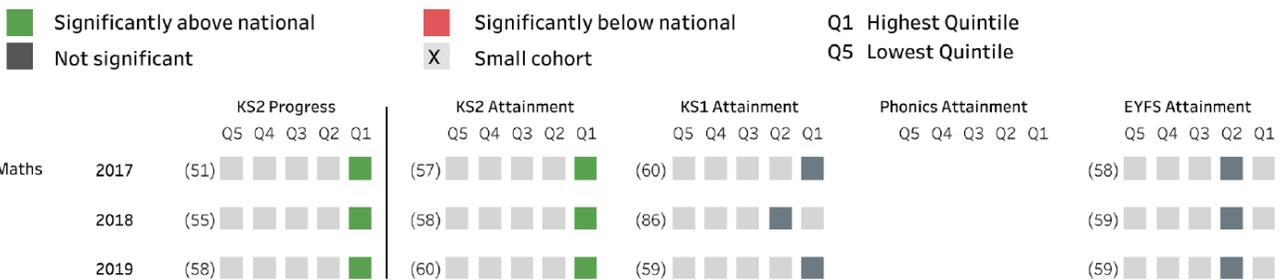
- Key stage 2 progress in mathematics (4.8) was significantly **above** national and in the **highest** 20% of all schools in 2019, as well as in 2018 and 2017.

Attainment (all key stages) Guidance

- Key stage 2 attainment of the expected standard (100+) in mathematics (97%) and the high standard (110+) in mathematics (62%) was significantly **above** national and in the **highest** 20% of all schools in 2019, as well as in 2018 and 2017. Of the 60 pupils, 2 did not meet the expected standard. Of these, 1 pupils had a score, with an average scaled score of 84.
- The key stage 2 three-year average mathematics attainment score (111.6) was in the **highest** 20% of all schools in 2019.

Progress and attainment trend

Reading, writing and mathematics three-year trend Guidance



Source IDSR - 22 January 2021