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...Changing lives

**The Parks Primary Academy Mathematics Strategy**

## Mathematics Ethos

At The Parks Academy we believe that being an adaptable, resourceful mathematician is essential to everyday life as mathematics teaches children how to make sense of the world around them. We challenge children to become fluent in a range of mathematical concepts, logical in their ability to reason and systematic and methodical approach when solving problems, both in maths and across the curriculum. Mathematicians at The Parks have a sense of enjoyment and curiosity about the subject, are resilient and have the confidence to make mistakes and try again: understanding that learning occurs and progress is made when challenges are faced and overcome.

## Rationale

Mathematics is a key aspect of the curriculum and along with reading, writing, speaking and listening, including oracy, it makes a significant contribution to the development of children as thinkers and learners. It is a central part of the academy's role that all pupils develop their mathematical ability and enjoy the process of cultivating this lifelong skill. At The Parks Academy, we aim to do two things; encourage and develop a lifelong love of maths, and to teach pupils to be fluent mathematicians who can reasoning and solve problems for a variety of purposes. This aims to ensure there is a rigorous and sequential approach to the teaching of mathematics, resulting in an embedded ethos of achievement.

## Aims
We aim to:

- Nurture the children's sense of themselves as mathematicians

- Create an ethos of achievement in mathematics

- Ensure the delivery of Maths is filled with cross curricular opportunities.

- Ensure children are fluent in the number facts, including the times tables, and can apply this knowledge.

- Encourage children to use mathematical vocabulary to reason and explain, including using oracy skills,  to show much deeper understanding

- Encourage children to become enthusiastic, confident and reflective problem solvers.

- Challenge children to stretch themselves and take risks in their learning.

## Strategies for the teaching of mathematics

- At least one taught maths session is delivered daily, plus linked and continuous provision in the Foundation Stage (see Mathematical Development in the Foundation Stage for further details).

- The academy follows the structure of Same Day Intervention for Years 2 to 6 (see below)

- LTP for SDI – Y2 to Y6 use the White Rose LTP as a loose guide to ensure coverage. However, to ensure this works effectively for us, appropriate weighting is applied to each strand to meet pupils' needs. This LTP is used in conjunction with the RAG, which measures whether pupils have accessed ARE with no support, little support, weighted support, or have been unable to access the strand. (See Appendix A )

- MTP for SDI – The Delta Calculation Policy along with the WRM small steps serve as a medium term plan for SDI sessions.  These again serve as a guide to coverage along with RAG statement and QLA from both summative and formative assessments.

- Daily planning for SDI - Each class teacher is responsible for the planning and teaching of mathematics in their class. The following resources are an example of those used to assist teachers with their planning:
  *White Rose Maths*
  *NCETM website and resources*
  *NRICH resources*
  *Test Base resources*

- All maths sessions will have a clear objective-link to NC.

- A working wall should be visible in all classrooms with the non-negotiables displayed (Appendix B)

- Opportunities for developing maths in the wider curriculum should be exploited wherever possible .

- Teachers will identify pupils who are working below or well below ARE (those with SEND) who will need support in addition to this session. This support may include interventions, pre-teaching or teaching objectives taken from a lower year group, depending on the needs of the individual.

- Teachers will support the bottom 20% of children by giving access to manipulatives, physical resources (such as hundred squares, number lines, place value charts etc) and models/images.

## Session structure for Same Day Intervention:

- The first session is led by the teacher to introduce new learning or to rehearse a skill or a strategy using an "I do, you do" method (teacher modelling) and/or a "we do, you do" method (shared work).

- This is followed by a '5 questions' task where the children complete 5 mathematics questions. These questions will include at least two fluency questions (which include a variation of question types including word problems) and at least two reasoning and /or problem solving questions.

- The children then have a 15-minute break whilst the teacher marks their work and assesses the children for progression in their learning. The second part of the session will consist of:

  BRONZE CHALLENGE (SDIB)- SDI Group - adult led group, teacher input, then an opportunity for the children to apply their learning by completing a bronze challenge which mirrors the fluency questions.

  SILVER CHALLENGE (ATS) – include reasoning and problem solving which mirrors the reasoning/problem solving questions

GOLD CHALLENGE (ATG) - reasoning and problem solving challenges with a greater depth focus. This will include opportunities for collaborative work with peers using mastery sentence stems to aid oracy discussions.

DIAMOND CHALLENGE (ATD) –Towards the end of the academic year, if a child is working consistently within greater depth in his/her year group, then they may work in the diamond group. The child will skip past the initial teacher 'I do, you do' input and work through the first five questions independently, before moving onto the gold challenge. After the break, any gaps that have been identified will be closed and the child may move onto a diamond challenge, which is an activity at further greater depth in their year group and may come from a further year group/key stage.

## Same Day Intervention in Year 1

- Year 1 use a pacing grid to ensure coverage throughout the year (Appendix C)

- Maths in Year 1 is initially to be taught practically with fluency being the focus for questioning.

- Children who are secure within the fluency strand with be challenged with reasoning style questions.

- Same Day Intervention is to be implemented when it is appropriate for the cohort. As a guide, pupils will have access to reasoning and problem solving through the provision in the autumn term. As the year progresses, maths will become more formalised and look more like Y2-6.

- For the majority of pupils, by the Summer Term, all children will be exposed to the Same Day Intervention sessions to prepare them for Year 2.

## Consistency in format and presentation

- Children will use a pencil for all mathematics work.

- All year groups will have a squared mathematics book and children will write one digit in one square.

- There should be evidence of 4 mathematics sessions per week.

- Questions should be listed in lower cased lettered form e.g. a, b, c

- Learning objective will be evident at the start of each piece of new learning

- *CCW Cursive Writing* font will be used in KS1 for typed worksheets and *XCCW Joined* will be used in KS2.

- The date will be written at the start of each piece of new learning.  Years 1-3 will write the numeral date (e.g. 19.10.19). Years 4 – 6 will write the date in Roman Numerals (e.g. XIX.X.MMXIX). The date will be underlined with a ruler.

## Marking and feedback

- Correct answers should have a green square in green pen placed at the end of the children's response, incorrect answers a green dot placed at the end of the children's response.

- The learning objective will be deemed to have been achieved if all of the fluency questions in the first session are correct. Learning objectives that have been achieved should have a clear swipe through the letters LO with a green highlighter and learning objectives that have not been achieved should have a green dot to the left of it.

- For the second session, the question will be marked with the green square(as stated above) and the letters SDIB/ATS/ATG/ATD will be swiped with a green highlighter if all parts of the question have been correctly

# Mathematical Development in the Foundation Stage

*(Also see 'The Foundation Stage Policy for Mathematical Development: Problem Solving, Reasoning and Numeracy')*

- Mathematics in the Foundation Stage will be taught daily by teacher/adult-led sessions and through continuous provision.

## Aim:

- The Foundation Stage aim is to support, foster, promote and develop children's mathematical development by providing opportunities for all children to develop their understanding of number, measurement pattern and space in a broad range of contexts in which they can explore, enjoy, learn and talk.

## A stimulating mathematical curriculum is provided by:

- Planning a range of activities that promote mathematical development;
- Ensuring that the continuous provision in all areas of the Foundation Stage stimulates mathematical thinking thus embracing the notion of the hidden curriculum;
- Providing a range of extra curricula activities such as number and shape walks, shopping trips, baking and visits to the park.
- Developing mathematical thinking through spontaneous activities, all of which help to promote children's mathematical development.

## Strategies for the teaching of Mathematics in the Foundation Stage include

- Planning the environment carefully so that children can initiate activities that promote the learning of mathematical skills and which can be extended;
- Planning activities that are purposeful;
- Planning games that give children opportunities to practice their mathematical skills and knowledge thus consolidating and extending their learning;
- Creating an environment where the children are confident and enthusiastic to join in with or talk about mathematical activities.

# Appendix A

## White Rose Maths Hub Long Term Plan

Year 2

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Autumn | Number: Place Value | | | Number: Addition and Subtraction | | | | | Measurement: Money | | Number: Multiplication and Division | |
| Spring | Number: Multiplication and Division | | Statistics | | Geometry: Properties of Shape | | | Number: Fractions | | | Measurement: Length and Height | Consolidation |
| Summer | Position and Direction | | | Problem solving and efficient methods | | Measurement: Time | | Measurement: Mass, Capacity and Temperature | | | Investigations | |

Year 3

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Autumn | Number: Place Value | | | Number: Addition and Subtraction | | | | | Number: Multiplication and Division | | | Consolidation |
| Spring | Number: Multiplication and Division | | | Measurement: Money | Statistics | | Measurement: Length and Perimeter | | | Number: Fractions | | Consolidation |
| Summer | Number: Fractions | | | Measurement: Time | | | Geometry: Property of Shapes | | Measurement: Mass and Capacity | | | Consolidation |

## Year 4

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Autumn** | Number: Place Value | | | | Number: Addition and Subtraction | | | Measurement: Length and Perimeter | Number: Multiplication and Division | | | Consolidation |
| **Spring** | Number: Multiplication and Division | | | Measurement: Area | Fractions | | | | Decimals | | | Consolidation |
| **Summer** | Decimals | | Measurement: Money | | Measurement: Time | Statistics | | Geometry: Property of Shape | | | Geometry: Position and Direction | Consolidation |

## Year 5

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Autumn** | Number: Place Value | | | Number: Addition and Subtraction | | Statistics | | Number: Multiplication and Division | | Perimeter and Area | | Consolidation |
| **Spring** | Number: Multiplication and Division | | | Number: Fractions | | | | | | Number: Decimals and Percentages | | Consolidation |
| **Summer** | Number: Decimals | | | Geometry: Properties of Shapes | | | | Geometry: Position and Direction | Measurements: Converting Units | | Measurement: Volume | Consolidation |

Year 6

| | Week 1 | Week 2 | Week 3 | Week 4 | Week 5 | Week 6 | Week 7 | Week 8 | Week 9 | Week 10 | Week 11 | Week 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Autumn | Number: Place Value | | Number: Addition, Subtraction, Multiplication and Division | | | | Fractions | | | | Geometry: Position and Direction | Consolidation |
| Spring | Number: Decimals | | Number: Percentages | | Number: Algebra | | Measurement: Converting Units | Measurement: Perimeter, Area and Volume | | Number: Ratio | | Consolidation |
| Summer | Geometry: Properties of Shapes | | Problem solving | | | Statistics | | Investigations | | | | Consolidation |

# Appendix B

## Working Wall Display
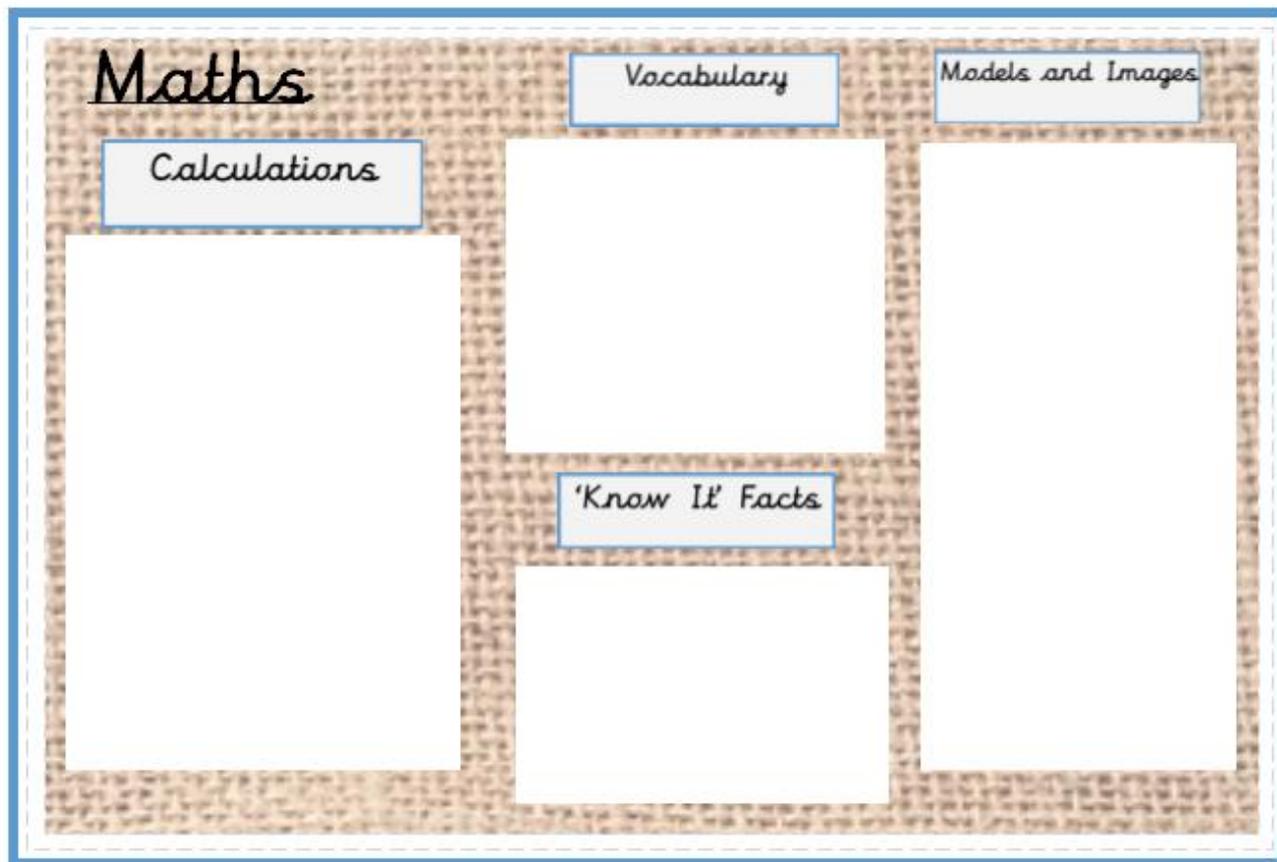
# Appendix C

# Y1 Pacing Grid

| Week | Maths Yearly Overview | | Week | Maths Yearly Overview |
|---|---|---|---|---|
| 1 | Place value to ten/twenty | | 5 | Multiplication and division |
| 2 | | | 6 | |
| 3 | Addition and Subtraction to ten | | | |
| 4 | | | 1 | Number bond to ten and twenty |
| 5 | Shape | | 2 | |
| 6 | Place Value to twenty | | 3 | Fractions |
| 7 | | | 4 | |
| 8 | Consolidate | | 5 | Time |
| | | | 6 | Shape |
| 1 | Time | | 1 | Money |
| 2 | Position and direction | | 2 | |
| 3 | Number bonds to ten | | 3 | Place Value to 100 |
| 4 | | | 4 | |
| 5 | Addition and Subtraction within twenty | | 5 | Consolidate |
| 6 | | | | |
| 7 | Consolidate | | 1 | Weight |
| | | | 2 | Volume |
| 1 | Place value to 50 multiples of 2,5,10 | | 3 | Multiplication and division |
| 2 | | | 4 | |
| 3 | Measurement—length and height | | 5 | |
| 4 | | | 6 | Consolidate |