Intent

Maths

Intent

At Ditton Lodge our vision statement is that 'Together we succeed as lifelong learners'. This is carried throughout every area of the curriculum including PE.

Our values are that children LEARN (Listen, Enjoy & take risks, Aim high & achieve, Respect and Never give up) these values will be demonstrated by students within each lesson.

Students will develop the necessary skills, to secure fluency in number and an ability to manipulate number to support their problem solving and reasoning. In Maths, we provide rich learning opportunities that encourage our children to aim high and achieve, as Maths is the foundation for their understanding and experience of the world beyond Ditton Lodge.

Intent

Maths

Aims

The National Curriculum for maths aims to 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 develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- 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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Intent

Maths

National Curriculum (KS1)

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.

Intent

Maths

National Curriculum (Lower KS2)

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.

Intent

Maths

National Curriculum (Upper KS2)

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.

Intent

Maths

Why is Maths important?

"Good numeracy is the best protection against unemployment, low wages and poor health."

Andreas Schleicher
OECD

- We use maths in every aspect of our lives at work and in practical everyday activities at home and beyond.
- Decisions in life are so often based on numerical information; to make the best choices, we need to be numerate.
- The digital age presents us with more numerical data than ever before and puts a new premium on numeracy skills.

Intent

Cross Curricular Links

Maths provides opportunities for pupils to develop the key skills of:

- **Communication and teamwork**
- Computing
- **Music and Dance**
- **Art**
- **Design**
- **Science**
- **Geography**
- **P.E.**

Implementation

Implementation

At Ditton Lodge, we follow White Rose Maths in order to ensure that our children have full coverage of the Key Objectives for Maths. White Rose Maths is ordered in blocks to ensure progression in number skills, as place value needs to be taught before addition and subtraction or multiplication and division. Each lesson in all year groups follows a specific sequence to ensure consistency throughout the school.

Implementation

Implementation

All teachers tailor their planning to suit the abilities of their cohort and offer the support and challenge needed for each child to make progress. The programme outlines activities that boost children's mathematical fluency and consistently uses models and images to help children visualise concepts and abstract problems.

Key mathematical vocabulary is an essential part of each lesson and the children are encouraged to reason through their ideas and problem solve, using the language they have acquired.

Maths is widely promoted throughout the school and each classroom has a working wall that the children can utilise to support their learning and provide extra challenge. Pupils are encouraged to transfer their knowledge of Maths and apply it in other contexts including other subjects e.g. science, art, computing and their everyday lives.

Each year, we also offer a dedicated week to problem solving and reasoning that encourages children to work cooperatively, building positive relationships and mathematical experiences. to add text

Implementation

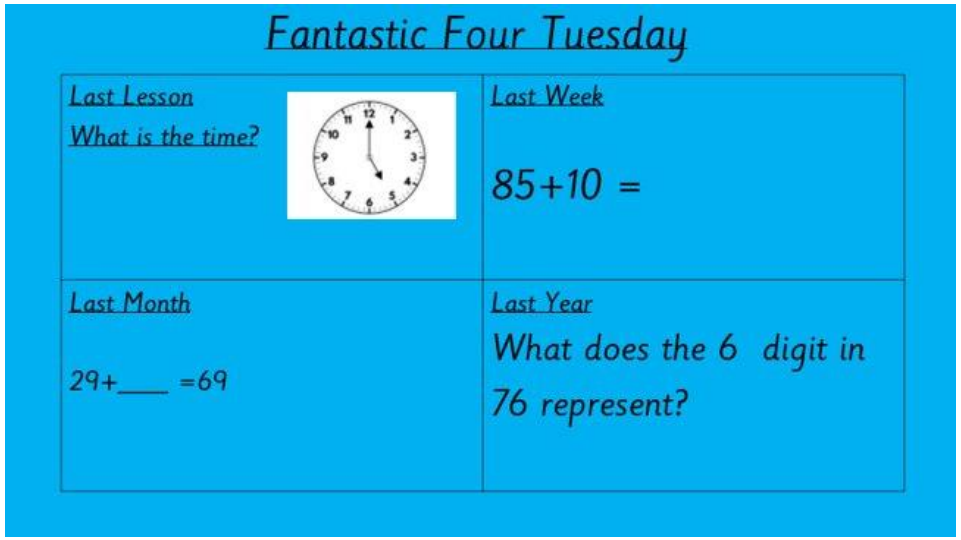
Implementation

Typical *Maths* lesson structure:
10- minutes – Fantastic Four/Get Ready
20 minutes – First quality teaching(My Turn, Our Turn,YourTurn).
20- minutes - Independent work or guided work.
10-minutes –Explanation and Reasoning

Implementation

Implementation

All lessons start with the Fantastic Four(Year1)/Get Ready which offers children the opportunity to retrieve skills and concepts previously taught.



1) Subtract the ones

5 – 3 = ☐ 4 – 4 = ☐

2) Subtract the tens

50 – 30 = ☐ 40 – 20 = ☐

3) What happens when we subtract 0

3 – 0 = ☐ 30 – 0 = ☐

Implementation

Implementation

Teachers demonstrate a new mathematical concept or process through varied fluency in ‘My Turn’ ,then in ‘Our Turn’ it is an opportunity for teachers to ask the children key questions to assess their understanding and acquisition of language, using a similar problem. Finally in ‘Your Turn’pupils are encouraged to work independently, using a worked example from 'My Turn' for support. .

Implementation

Implementation

Concrete –Pictorial-Abstract

We believe that all children, when introduced to a new concept, should have the opportunity to build competency by taking this approach.

Concrete – children should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – alongside this children should use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support children's understanding of abstract methods.

Implementation

Learning in EYFS

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The aim of this document is to help subject leaders to understand how the skills taught across EYFS feed into national curriculum subjects.

This document demonstrates which early years outcomes are prerequisite skills for mathematics within the national curriculum. The table below outlines the most relevant early years outcomes from 30-50 months to ELG, brought together from different areas of the Early Years Foundation Stage to match the programme of study for mathematics.

The most relevant early years outcomes for mathematics are taken from the following areas of learning:

- Communication and Language
- Mathematics

Implementation

Learning in EYFS

Mathematical Vocabulary			
30-50 Months	Communication and Language	Speaking	To build up vocabulary that reflects the breadth of their experiences.
40-60 Months	Communication and Language	Speaking	To extend vocabulary, especially by grouping and naming, exploring the meaning and sounds of new words.
Number and Place Value			
Counting			
30-50 Months	Mathematics	Numbers	To recite numbers in order to 10. To realise not only objects, but anything can be counted including steps, claps or jumps.
40-60 Months	Mathematics	Numbers	To count up to three or four objects by saying one number name for each item. To count out up to six objects from a larger group. To count actions or objects which cannot be moved. To count objects to 10 and beginning to count beyond 10. To count an irregular arrangement of up to ten objects. To estimate how many objects they can see and check by counting them.
ELG	Mathematics	Numbers	To count reliably with numbers from one to 20.
Identifying, Representing and Estimating Numbers			
30-50 Months	Mathematics	Numbers	To use some number names and number language spontaneously. To know that numbers identify how many objects are in a set. To show an interest in representing numbers. To begin to represent numbers using fingers, marks on paper or pictures. To separate a group of three or four objects in different ways, beginning to recognise that the total is still the same.

Click to add text

Implementation

Learning in EYFS

40-60 Months	Mathematics	Numbers	To select the correct numeral to represent 1 to 5, then 1 to 10 objects. To say the number that is one more than a given number. To find one more or one less from a group of up to five objects, then ten objects.
ELG	Mathematics	Numbers	To say which number is one more or one less than a given number from one to 20.
Reading and Writing Numbers			
30-50 Months	Mathematics	Numbers	To show an interest in numerals in the environment. To use some number names accurately in play.
40-60 Months	Mathematics	Numbers	To recognise some numerals of personal significance. To recognise numerals 1 to 5.
Compare and Order Numbers			
30-50 Months	Mathematics	Numbers	To compare two groups of objects, saying when they have the same number.
40-60 Months	Mathematics	Numbers	To use the language of 'more' and 'fewer' to compare two sets of objects.
ELG	Mathematics	Numbers	To place numbers one to 20 in order.
Understanding Place Value			
30-50 Months	Mathematics	Numbers	To show curiosity about numbers by offering comments or asking questions.
Solve Problems			
30-50 Months	Mathematics	Numbers	To show an interest in number problems.
40-60 Months	Mathematics	Numbers	To begin to identify own mathematical problems based on own interests and fascinations.
Addition and Subtraction			
Mental Calculations			
40-60 Months	Mathematics	Numbers	To find the total of items in two groups by counting all of them. To begin to use the vocabulary involved in adding and subtracting in practical activities and discussion.
ELG	Mathematics	Numbers	To add and subtract two single-digit numbers and count on back to find the answer using quantities and objects.
Solve Problems			
ELG	Mathematics	Numbers	To solve problems, including doubling, halving and sharing.
Measurement			
Describe, Measure, Compare and Solve (all strands)			
40-60 Months	Mathematics	Shape, Space and	To order two or three items by length or height.

Implementation

Learning in EYFS

Telling the Time			
40-60 Months	Mathematics	Shape, Space and Measure	To use everyday language related to time. To order and sequence familiar events. To measure short periods of time in simple ways.
Money			
40-60 Months	Mathematics	Shape, Space and Measure	To begin to use everyday language related to money.
Properties of Shapes			
Recognise 2D and 3D Shapes and their Properties			
30-50 Months	Mathematics	Shape, Space and Measure	To show an interest in shape and space by playing with shapes or making arrangements with objects. To show interest in shape by sustained construction activity or by talking about shapes or arrangements. To show interest in shapes in the environment. To use shapes appropriately for tasks. To begin to talk about shapes in everyday objects, e.g. 'round' and 'tall'.
40-60 Months	Mathematics	Shape, Space and Measure	To begin to use mathematical names for 'solid' 3D shapes and 'flat' 2D shapes, and mathematical terms to describe shapes. To select particular named shapes.
ELG	Mathematics	Shape, Space and Measure	To explore characteristics of everyday objects and shapes and use mathematical language to describe them.
Compare and Classify Shapes			
30-50 Months	Mathematics	Shape, Space and Measure	To show awareness of similarities of shapes in the environment.
Position and Direction			
Position, Direction and Movement			
30-50 Months	Mathematics	Shape, Space and Measure	To use positional language.
40-60 Months	Mathematics	Shape, Space and Measure	To describe their relative position, such as 'behind' or 'next to'.
Patterns			

Intent

Units of work:

Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | 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 (within 10)				Number: Addition and Subtraction (within 10)					Geometry: Shape	Number: Place Value (within 20)	
Spring	Consolidation	Number: Addition and Subtraction (within 20)			Number: Place Value (within 50)			Measurement: Length and Height		Measurement: Weight and Volume		Consolidation
Summer	Consolidation	Number: Multiplication and Division			Number: Fractions		Geometry: Position and Direction	Number: Place Value (within 100)		Measurement: Money	Measurement: Time	

Intent

Units of work:

Year 1 | **Year 2** | Year 3 | Year 4 | Year 5 | 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 and Subtraction					Measurement: Money		Number: Multiplication and Division	Consolidation
Spring	Number: Multiplication and Division				Statistics		Geometry: Properties of Shape			Number: Fractions		
Summer	Measurement: Length and Height		Geometry: Position and Direction		Consolidation and problem solving		Measurement: Time		Measurement: Mass, Capacity and Temperature			Consolidation

Intent

Units of work:

Year 1 | Year 2 | **Year 3** | Year 4 | Year 5 | 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 and Subtraction					Number: Multiplication and Division			
Spring	Number: Multiplication and Division			Measurement: Money	Statistics		Measurement: Length and Perimeter			Number: Fractions		Consolidation
Summer	Number: Fractions			Measurement: Time			Geometry: Properties of Shape		Measurement: Mass and Capacity			Consolidation

Intent

Units of work:

Year 1 | Year 2 | Year 3 | **Year 4** | Year 5 | 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 and Subtraction			Measurement: Length and Perimeter		Number: Multiplication and Division		
Spring	Number: Multiplication and Division			Measurement: Area	Number: Fractions				Number: Decimals			Consolidation
Summer	Number: Decimals		Measurement: Money		Measurement: Time		Statistics	Geometry: Properties of Shape		Geometry: Position and Direction		Consolidation

Intent

Units of work:

Year 1 | Year 2 | Year 3 | Year 4 | **Year 5** | 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 and Subtraction		Statistics		Number: Multiplication and Division			Measurement: Perimeter and Area	
Spring	Number: Multiplication and Division			Number: Fractions						Number: Decimals and Percentages		Consolidation
Summer	Consolidation	Number: Decimals			Geometry: Properties of Shape			Geometry: Position and Direction		Measurement: Converting Units		Measurement: Volume

Intent

Units of work:

Year 1 | Year 2 | Year 3 | Year 4 | Year 5 | **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					Number: Fractions				Geometry: Position and Direction
Spring	Number: Decimals		Number: Percentages		Number: Algebra		Measurement: Converting Units	Measurement: Perimeter, Area and Volume		Number: Ratio		Consolidation
Summer	Statistics		Geometry: Properties of Shape				Consolidation and themed projects					

Intent

Example of lesson by lesson overview KS1

Year 1 | Autumn Term | Week 1 to 4 – Number: Place Value

Overview

Small Steps

- Sort objects
- Count objects
- Represent objects
- Count, read and write forwards from any number 0 to 10
- Count, read and write backwards from any number 0 to 10
- Count one more
- Count one less
- One-to-one correspondence to start to compare groups
- Compare groups using language such as equal, more/greater, less/fewer

Intent

Example of lesson by lesson overview KS2

Lessons indicated with an R are an opportunity to revisit.

Year 6 | Autumn Term | Week 1 to 2 – Number: Place Value

Overview

Small Steps

Numbers to 10,000	R
Numbers to 100,000	R
Numbers to a million	R
Numbers to ten million	
Compare and order any number	
Round numbers to 10, 100 and 1,000	R
Round any number	
Negative numbers	

Example of planning KS1

Implementation

Year 1 | Autumn Term | Week 1 to 4 – Number: Place Value

White Rose Maths

Sort Objects

Notes and Guidance

Children need to sort groups by characteristics before they count. Children should be encouraged to sort objects into groups in a variety of ways,for example, sorting a group of children into girls and boys or sorting counters by colour.

Children should be encouraged to line sorted objects up to link to the early representations of bar models.

Mathematical Talk

How can you sort the objects?

Are there any different ways they could be sorted?

How have you grouped the objects?

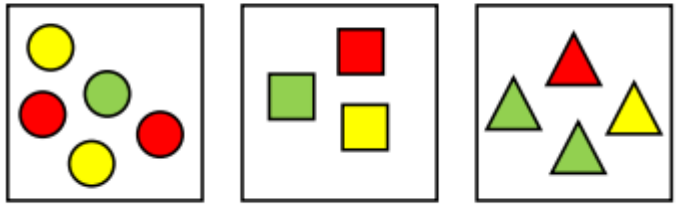
How do you think these objects have been grouped?

Can there be more than 2 groups?

Varied Fluency

- Sort the fruit into groups and explain how you have sorted them.

- How many ways can you sort the children into groups?

- 

How have these objects been grouped?
How else could you group them?

Implementation

Homework

Weekly homework (Fantastic Four/Exciting Eights) offers children the opportunity to retrieve skills and concepts from the current week, last week, last month and last year.

Example of planning KS2

Implementation

Year 5 | Autumn Term | Week 1 to 3 – Number: Place Value

Numbers to 10,000

Notes and Guidance

Children use concrete manipulatives and pictorial representations to recap representing numbers up to 10,000

Within this step, children must revise adding and subtracting 10, 100 and 1,000

They discuss what is happening to the place value columns, when carrying out each addition or subtraction.

Mathematical Talk

Can you show me 8,045 (any number) in three different ways?

Which representation is the odd one out? Explain your reasoning.

What number could the arrow be pointing to?

Which column(s) change when adding 10, 100, 1,000 to 2,506?

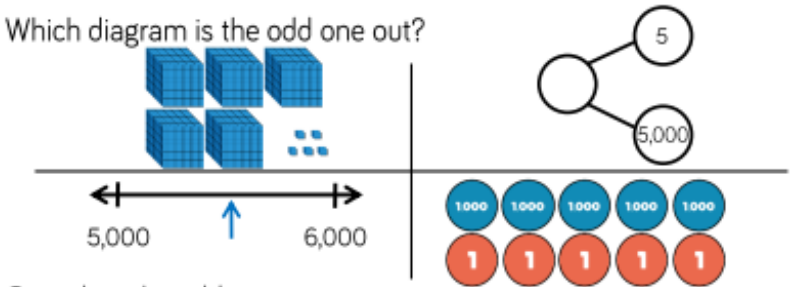
Varied Fluency

R

Match the diagram to the number.

4,005 | 4,500 | 4,050

Which diagram is the odd one out?



Complete the table.

	Add 10	Add 100	Add 1,000
2,506			
7,999			
		6,070	

©White Rose Maths

Impact

Maths

Impact

Implementation

How do you monitor progress and achievement?

- Fantastic Four is used to help reinforce previous learning
- Success criteria
- Key questioning
- Key vocabulary
- Verbal feedback
- Plenaries designed to check understanding of lesson topic and reasoning
- Weekly arithmetic papers to measure progress in KS2
- Fortnightly timestables tests
- Use of trust assessment grid
- Use of termly tests to help measure progress

Impact

Impact of assessment on teaching

- Termly summative assessments are carried out in years 2-6.
- PIXL and SATs tests provided opportunities to assess all programmes of study outlined by the National Curriculum.
- Analysis of QLAs enables teachers to identify gaps in puils knowledge and tailor planning accordingly.
- Formative assessment of progress/misconceptions within the lesson is given in verbal feedback by the teacher.
- Formative assessment is also carried out through NCTEM Teaching for Mastery units.

Impact

How do you measure the impact of Maths teaching?

- Pupil voice
- Scrutiny of planning
- Learning walks
- Observations
- CPD feedback

Impact

How do you measure the impact of Maths teaching?

Subject Leaders use iAbacus as a tool for developing their subject, as seen in this example:

Impact

What do you consider to be the strengths of Maths within the school?

- **Consistency in planning**
- Use concrete ,pictorial and abstract
- Analysis of assessment data to spot trends and gaps in knowledge.
- Weekly maths homework
- Reasoning vocabulary modelled by teachers and used by pupils.
- Transistion between year groups.

How do you know?

Data analysis
Puil books
Half-termly learning walks/observations
Pupil Voice Questionnaire