Village Infants School

MATHEMATICS POLICY

Mathematics is the study of relationships in number, measures, space and data-handling and their application to solving problems in a variety of situations.

It provides children with a way of viewing and making sense of the world in which they live. Building on their own experience, it encourages thinking and reasoning skills, embraces natural curiosity and develops the confidence to tackle problems which arise not only in mathematics but other areas of the curriculum.

Document Adopted By Governing Body	
Date:	March 2023
Signed (Chair):	
Date:	March 2023
Print Name:	
Date of Next Review:	September 2024

TEACHING AIMS

- To foster a positive attitude to maths for all children enabling them to approach mathematical activities with confidence, understanding and pleasure.
- To provide a curriculum which meets the needs of The Foundation Stage and KS1 of the National Curriculum, and the objectives of the Primary Framework for Mathematics.
- To provide a curriculum which is appropriate to the needs and learning styles of all children, and will develop enquiring, logical, investigative and problem solving approaches.
- To build upon and extend the children's previous experiences and ensure progression in the development of their understanding, knowledge and use of mathematical language.
- To inform parents of their child's progress and suggest ways they can support them in their learning.

MATHEMATICAL OBJECTIVES

- To communicate mathematical ideas and concepts using appropriate language.
- To understand mathematical symbols and mathematical language.
- To use a range of recording methods.
- To select and use a range of mathematical resources.
- To apply what they have learnt in different situations.
- To value the process of enquiry as well as the answer and to appreciate that the definitive answer is not always possible.

PUPILS EXPERIENCES

Teaching approaches

- At Village Infants School we believe that progression should be planned at an individual rate.
- Success is vital, but so is challenge, therefore we aim to ensure children are actively engaged both mentally and physically.
- Children will be given time to: -
    - use trial and adjustment approaches
    - undertake mental work
    - develop their own methods
    - discuss their methods with adults and other children.

Making Connections

- At Village Infants school we teach for understanding. In lessons we plan to link the following:
    - Concrete (real physical objects eg: cubes, beanstrings, children, fingers, stones, board games, dice, Numicon/Cuisenaire etc.)
    - Language (formal and abstract mathematical language, e.g. take away, subtract, equals, how many left?)
    - Pictures (100 squares, number lines, number strips, sorting and matching diagrams, bar graphs.)

- Symbols (mathematical symbols, 1, 2, 3, + - = etc.)

From Haycock & Cockburn (2003)

EARLY YEARS

In Early Years the organisation and management of mathematics lessons is tailored to meet the needs of the children who arrive from different settings eg. Nursery, playgroup etc, and therefore will have had different learning experiences.

The yearly teaching programme for Reception is in line with the Early Learning Goals and provides a bridge from the goals to the National Curriculum that begins in Year 1.

In Reception, a wide range of activities supports the teaching and learning of mathematics, including stories, songs, rhymes, imaginative play, games and outdoor play. Over a week, the teaching of maths will include whole class activities eg. counting, discussion of main teaching objectives, group activities, and short plenary sessions. These are approached flexibly to accommodate the needs of the children.

KEY STAGE ONE

In lessons we use mental starters, whole class/group teaching, relevant tasks and activities, and plenaries. We use targets clouds and key performance indicators to support with differentiation and progression. We revisit objectives regularly and give the children opportunities to apply what they learnt in different situations.

Lessons involve the following:

- Counting, forwards, backwards in different steps.
- Mental and oral skills – quick recall and revisiting previous objectives.
- Sharing of objectives – We are learning to…
- Co-constructing success criteria – Children build the success criteria with the teacher, and this is displayed throughout the lesson for children to refer to.
- Review – including self-assessment using smiley faces, thumbs up. Children indicate how they felt they did.
- A balance of teacher and pupil talk.
- Use of models and images to support the learning.
- Opportunities for children to model what they know and be the teacher.
- Pupil activity – group, pair and individual work.
- Practical activities
- Progress and misconceptions are identified and next steps identified.

SCHEME OF WORK

The objectives identified in the National Curriculum are used to form the basis of all planning. Other resources available are explored and incorporated to give children opportunities to learn skills and knowledge, and to apply them.

MARKING IN KEY STAGE ONE

We use 'on the spot marking'; where teachers mark children's learning in lessons, and children have an opportunity to discuss their learning with their teacher. On occasions, teachers also use smiley faces to show what went well, and give some improvements for the children to go back and complete. A marking code is displayed in each child's book.

Marking Code

u/a – unaided
w/h – with help
G/W – guided work
SGW-Small group work
c – cubes/numicon
f – fingers
mm – mental methods
100 – 100 square
sh/m – shared marking
o/f - oral feedback
I – improvement
Ch – challenge

ASSESSMENT AND TARGET SETTING

In Key Stage One we use clouds to identify individual targets for the children and these go in the back of their books, and in their reading diary and/or homework book to practise at home. Across the school Key performance Indicators are used to see if children have met the objectives from the curriculum. In Key Stage One, Key performance indicators, showing the national curriculum objectives, are put in the front of children's books. In Early Years, teachers have a grid of the Key performance Indicators, with objectives from the revised EYFS curriculum (2021). When children achieve an objective, the objective is dated. Teachers will then use these to inform planning, interventions and to identify children's individual targets.

RECORDING AND PRESENTATION

Children should not be encouraged to move too quickly to written work. In the early stages mental, oral and practical work take precedence. As children develop, they are encouraged to record their work in a variety of ways, develop personal methods of recording, compare and discuss alternate methods, refine and practise useful methods. These will vary according to the type of activity. They may include symbolic, statistical, diagrammatic, pictorial, verbal reporting or the construction of a model. As children become more involved in investigative activities the onus is on them to decide the most appropriate methods of recording.

PLANNING

Long term – Planning ensures coverage of the Early Learning Goals in the Foundation Stage. The Framework for mathematics has been used to plan the long-term teaching of mathematics in Year 1 and Year 2.

Medium term – Half termly overviews are used throughout the school to plan children's mathematical development.

Short term – Weekly maths plans are created for each year group, showing mental and oral and lesson objectives, whole class teaching and differentiated independent and teacher focus group activities.

EQUAL OPPORTUNITIES

In line with our equal opportunities policy, we aim to provide a balanced mathematical education for all children irrespective of gender race or ability.

We will endeavour to use material which values the diversity of cultural and linguistic backgrounds.

MEETING CHILDREN'S NEEDS

Through our assessment procedures we aim to identify children with additional needs to enable all children to achieve their full potential. Those children who are experiencing difficulties could be given adapted work, extra support either from the class teacher and support staff and are provided opportunities to attend additional interventions, and those who are very able mathematically are provided with challenges and support.

CATCH-UP PROVISION

In Key Stage One each year group has a designated person for Maths Intervention. In Year One, the focus is on supporting any confusion or misconceptions from whole class lessons, alongside assessing and supporting children to achieve their individual targets. In Year Two interventions, are used to support any confusions from whole class lessons, and certain concepts are retaught with children being identified from the Key Performance Indicators. In Early Years catch up provision is provided throughout the day based on objectives from the Key Performance Indicators.

GREATER DEPTH

Able children are challenged in mathematics through:

- Planning of particular activities to ensure progression and challenge within a lesson, including extension activities to give children opportunity to investigate and reason.
- Questions particularly directed at these children in whole class sessions.
- Assessments both formal and informal are reflected in planning.

EVERY CHILD MATTERS

We support the Governments vision for Child Services through the teaching of Mathematics in school. We approach our teaching in order that children will be able to engage, enjoy and achieve. We aim to prepare them for further education and achieving economic well-being in the future.

SUBJECT LEADER'S ROLE

- To work collaboratively with staff to promote continuity and progression.
- To attend relevant INSET courses, and encourage and support staff where possible.
- To organise staff training.
- Monitoring and organisation of centrally held resources.
- Purchase of resources in consultation with staff.
- To facilitate the development of mathematics identified in the School Development Plan.
- To review Maths Policy periodically.

AREAS FOR DEVELOPMENT

- To review the use of Maths target clouds.
- To ensure all teachers are using the Key Performance Indicators, and that they are regularly updated.

Mathematics, Written and Manipulatives

Addition

By the end of Key Stage One pupils should be confident in the following Mental Strategies:

- Counting forward in ones, twos, fives and tens.
- Counting forward in steps of ones, twos, fives and tens from any multiple e.g. count in fives from 25, tens from 60.
- Knowing all doubles up to double ten.
- Knowing all the pairs of numbers that make 10 and 20.
- Adding mentally a series of one-digit numbers, (such as 5 + 8 + 4);
- Adding multiples of 10 (such as 60 + 20) or of 100, (such as 600 + 200) using the related addition fact, 6 + 2, and their knowledge of place value;
- Partitioning two-digit numbers into multiples of 10 and 1 in different ways. It is important that pupils's mental methods of calculation are practiced and secured alongside their learning and use of an efficient written method for addition.

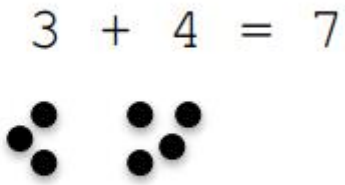
Counting in ones- Starting from 0 and then from any number

Counting out loud and practicing 1:1 correspondence (knowing that each object is a separate unit) It is also important that each number represents a group of objects (e.g. 3 = 3 teddies)

Simple addition using picture jottings

Drawing a picture- There were 4 yellow sharks and 1 blue. How many sharks were there altogether?

Dots or tally marks- 3 kids were on a bus and then 4 more got on. How many were on the bus in total?



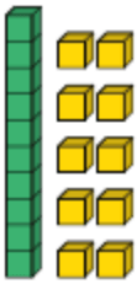
Use of Numicon

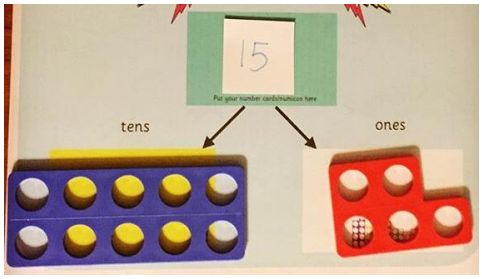
To help pupils to learn number facts and visualize quantities and what digits represent. To look for patterns and relationships in number. Use of Numicon number line to add.

Partitioning

Use of practical apparatus such as Numicon and dienes to partition and present place value of digits.

Place value cards and counters can be used to support understanding of place value.





The Hundred Square

The Hundred Square can be used to reinforce addition in the same way as a number line where a tens boundary is not crossed.

For example 24 + 5 = Also adding multiples of 10. Starting with '10 more.'

Then adding 2- digit numbers that do not cross a tens boundary. For example 53 + 24 =

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

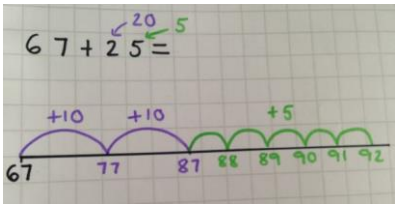
The empty number line

The mental methods that lead to column addition generally involve partitioning.

Pupils need to be able to partition numbers in ways other than into tens and ones to help them make multiples of ten by adding in steps.

The empty number line helps to record the steps on the way to calculating the total.

One step in their development when using a number line is to first be able to count on in tens and then ones.



Adding through partitioning

The next stage is to record mental methods using partitioning into tens and ones separately.

Add the tens and then the ones to form partial sums and then add these partial sums.

Partitioning both numbers into tens and ones mirrors the column method where ones are placed under ones and tens under tens.

e.g. 35+21=

30+20=50

5+1=6

50+6=56

Subtraction

By the end of Key Stage One pupils should be confident in the following Mental Strategies:

- Counting back in ones, fives and tens.
- Counting back in multiples of ones, fives and tens from any number. For example count back in fives from 35.
- Recalling all addition and subtraction facts to 10 and 20;
- Subtracting multiples of 10 (such as 60 –30) using the related subtraction fact, 6 – 3, and their knowledge of place value;
- Partition two-digit and three-digit numbers into multiples of tens and ones in different ways (e.g. partition 74 into 70 + 4 or 60 + 14).

Counting backwards in ones

Starting from 10 and then from any number

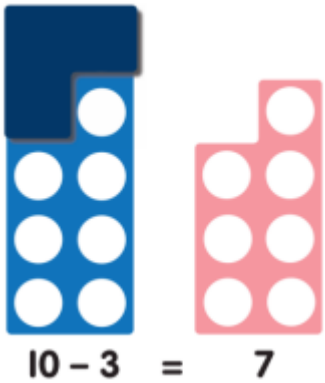
Counting out loud and singing number rhymes e.g. 'Five current buns' or 'ten green bottles', using visual pictures and puppets to show the process of getting less

Practical subtraction

Practical 1:1 correspondence of finding the first number and taking away the second to find out what is left.

I found 3 pebbles on a beach but I lost one! How many did I have left?

Use of Numicon to subtract using subitised pieces of equipment.



Simple subtraction using picture jottings

Drawing a picture

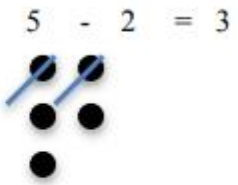
I had 5 apples but my teacher ate 3 of them. How many did I have left?

Dots or tally marks

There were 5 people of the bus but 2 got off at the first stop. How many people were still on the bus?

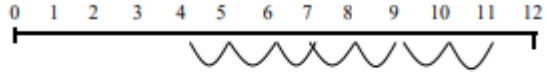
5 - 3 = 2

5-2=3



Counting back in ones along a number line/track

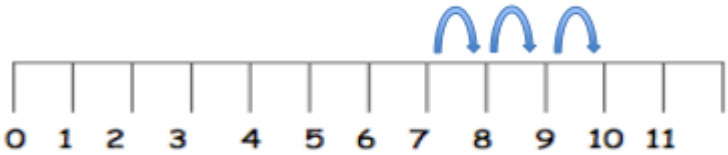
11 pupils are at school. 7 pupils go home because they feel sick. How many pupils are left in school? Pupils could use a pre-drawn number line and then begin to create their own.



11 – 7 = 4

Finding the difference

There are 10 pupils in our class today and 7 of them are having school dinner. How many are having packed lunch. Pupils are taught to count on from the smallest number to find the difference. (This can be done in their head or on a number line)



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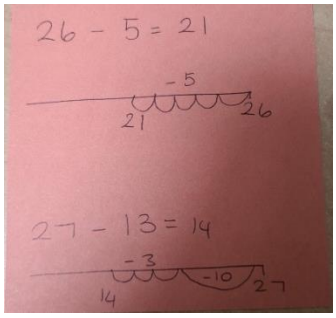

Subtracting through partitioning

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Subtract the tens and then the ones to form partial sums and then add these partial sums.

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e.g. 35-21=

30+20=10

5-1=5

10+5=15

Multiplication

To multiply successfully (by the end of Key Stage One), pupils need to be able to:

- Count in steps of different multiples, twos, fives, tens, and begin to count in threes.
- Recall all multiplication facts for 2,5 and 10.
- Recall doubles

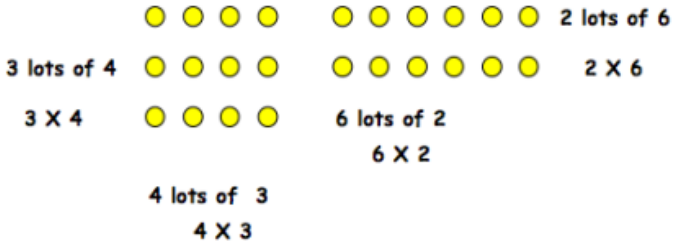
Repeated addition

e.g. 3 x 2 = 3 lots of 2 which is 2+2+2=6

If children aren't familiar with counting fluently, using manipulatives like numicon could be used to support.

Arrays

Successful written methods depend on visualising multiplication as a rectangular array. It also helps pupils to understand why 3 X 4 = 4 X 3



Counting

Children use their fingers to count.

E.g. 3 x 5= Children count in 5s, and stop when they have 3 fingers up. The number they land on is the answer.

Division

To divide successfully (by the end of Key Stage One), pupils need to be able to:

- Count in steps of different multiples, twos, fives, tens, and begin to count in threes.
- Recall all division facts for 2,5 and 10.
- Recall halves
- Have an understanding of the relationship between multiplication and division

Sharing

Practical sharing along with more pictures and jottings.

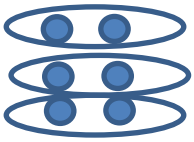
6 strawberries shared between 2 pupils. How many strawberries do they get each? 6÷2 =

Arrays/Grouping

Using the number being divided is used to create the arrays. Children stop counting on the number that is being divided.

e.g. 6÷2 Children draw 2 dots, and continue to draw the arrays in groups of 2 until they get to 6.

They then count how many groups they have



Counting

Children use their fingers to count.

E.g. 15 ÷ 5=

Children count in 5s, and stop counting at 15- see how many fingers they have up.