Northway Primary and Nursery School

Policy for Maths

Date of Policy: 19th November 2021

Date approved: 25th November 2021

By: The Governing Board of Northway Primary and Nursery School

Signed:

Chair of Governors

Subject Lead: Laura Scott

Date of Review: 1st October 2022

Northway:

Together we can achieve anything

All Learners, All valued, All achieving…All the time

Introduction:

Northway Primary and Nursery School is a strong and distinctive community, where we value each other as part of the family. We show this through our planning, our teaching, our relationships and respect for each other as individual learners. We are all learners – no matter our age or time within this or another School.

Learning potential is realised most when parents and teachers work in partnership. We believe in our children and we want our children to believe in themselves – they will then 'believe and achieve'. We set ourselves the high standard of: All learners, All achieving, All the time. Our Policy for Teaching and Learning is underpinned by this ethos.

The Northway Curriculum has a golden thread that links a rich tapestry of knowledge, interwoven with key skills and allows children to engage with, connect with and understand their locality and rich cultural offer and take their places as global citizens in the twenty first century.

The Northway Values for Victory exemplifies an ethos that builds community and provides the expectations for excellent attitude and learning behaviour. The curriculum is planned to allow children to explore, evaluate and improve. Children know the high expectations and are encouraged to strive for success in all that they do. Children are nurtured so they can engage with their learning without barriers and reach their own potential. Northway understands that aspiration is good but aspiration for all: all learners, all valued, all achieving…all the time.

Our Curriculum is a progressive programme of study, where children are exposed to knowledge and skills year on year. Children should see the 'big picture' as they progress through school and see building blocks coming into place. They will be immersed in a rich vocabulary and text-base to inspire a love of learning and given the opportunity to share their knowledge. Children can exemplify their prior knowledge and staff teach from this starting point, knowing the expectation for their specific year group. Low state quizzing for pre-assessments endeavour the development of sticky knowledge and post-assessment give children the satisfaction of achievement. Each subject area is taught discretely but has clear cross-curricular links and crossover of skills. We give core subjects and basic skills a strong emphasis but passionately believe in a wide, broad, rich curriculum, where children have deeper learning experiences and develop a life-long love of learning…developing dynamic and industrious citizens for Liverpool and the world who can make a positive contribution.

Excellence, enjoyment, enrichment, progression and relevance are all key principles of our Northway Curriculum from Nursery to Year 6.



RESPECT • TRUST • COURAGE • COMPASSION • FORGIVENESS • PERSEVERANCE • HOPE

1. Statement of consideration of equalities in all policies and procedures

This policy outlines the teaching, organisation and management of Mathematics taught at Northway Primary School. The policy has been drawn up as a result of staff discussion and has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all teaching staff.

2. Intent

Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.

At Northway we use the Liverpool maths plan that are linked to the National Curriculum, it is our aim to guide pupils to develop:

- a positive attitude towards mathematics and an awareness of the fascination of mathematics
- competence and confidence in mathematical knowledge, concepts and skills
- an ability to solve problems, to reason, to think logically and to work systematically and accurately.
- initiative and an ability to work both independently and in cooperation with others
- an ability to communicate mathematics
- an ability to use and apply mathematics across the curriculum and in real life
- an understanding of mathematics through a process of enquiry and experiment

The national curriculum for mathematics 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 non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

3. Implementation

Scheme of Work

At Northway we follow the guidance and directions of School Improvement Liverpool Maths planning scheme (available upon request; each year group takes ownership of this booklet, PDF copy on school shared drive). The scheme draws on the National Curriculum objectives and simplifies into smaller sequencing steps of learning to provide pupils with a detailed sequence of learning and progression within a variety of mathematical strands. School Improvement Liverpool provide a supported Calculation policy to adhere to the key methods and strategies require to teach within the objectives in order to embed leering (as below). Basic skills for each year group are also evident and progressive across the key stages.

Strategies – calculation policy

The Liverpool Maths Team has developed a calculation policy to support effective implementation of the 2013 Primary National Curriculum.

The policy focuses on the four operations of addition, subtraction, multiplication and division and includes a list of the key mental maths skills that support written methods.

For each operation, there are four stages, starting with the practical methods that support conceptual understanding moving through to methods that allow children to demonstrate efficiency in procedural approaches.

It is important to emphasise that alternative methods may be more appropriate for certain calculations and that informal methods currently used successfully in schools may continue to be used as they support the raised expectations in calculation outlined in this policy:

Addition

Written methods for addition

It is important that children's mental methods of calculation are practised on a regular basis and secured alongside their learning and use of written methods of addition.

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use a written method accurately and with confidence.

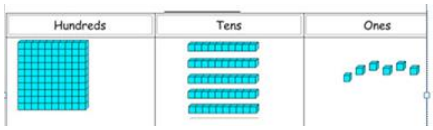
Children are taught and acquire secure mental methods of calculation and one written method of calculation for addition which they know they can rely on when mental methods are not appropriate.

This policy shows the possible stages of each written method for addition, each stage building towards a more refined method.

There are some key basic skills that children need to help with addition, which include:

- counting
- estimating amounts and totals
- recalling all addition **pairs** to 10, 20 and 100 (7 + 3 = 10, 17 + 3 = 20, 70 + 30 = 100)
- knowing number **facts** to 10 (6 + 2 = 8)
- adding mentally a series of one-digit numbers (5 + 8 + 4)
- adding multiples of 10 (60 + 70) or of 100 (600 + 700) using the related addition fact, 6 + 7, and their knowledge of place value
- partitioning two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways (432 into 400 + 30 + 2 and also into 300 + 120 + 12) – (Additive component of place value):

100	200	300	400	500	600	700	800	900
10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9



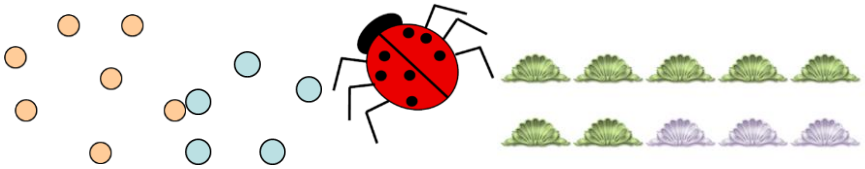
- understanding and using addition and subtraction as inverse operations

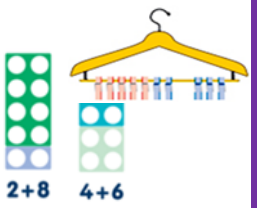
Using and applying is a key theme and one of the aims of National Curriculum and before children move onto the next stage in written calculation it is important that their skills are broadened through their use and application in a range of contexts, these include:

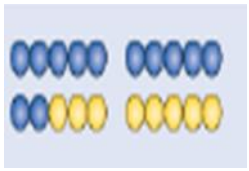
- using inverse
- missing box questions
- using units of measure including money and time
- word problems
- open ended investigations

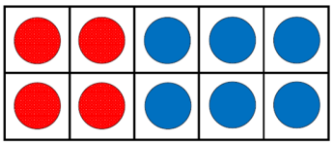
Stage 1: Practical (combining) and adding on (increasing)

Prior to recording addition steps on a number line, children will work practically with equipment where they are **combining** sets of objects. As they become more confident, this practical addition of sets of objects will be mirrored on a number line so that the two are being done together and children are **adding on**. This will prepare them for the abstract concept of adding numbers rather than objects.





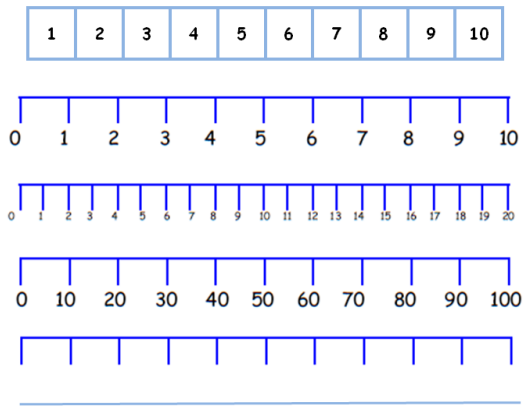


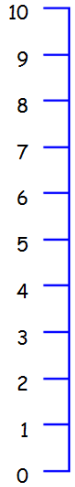


Visualising and securing number facts

Stage 2: Number tracks and number lines

10	20	30	40	50	60	70	80	90
1	2	3	4	5	6	7	8	9



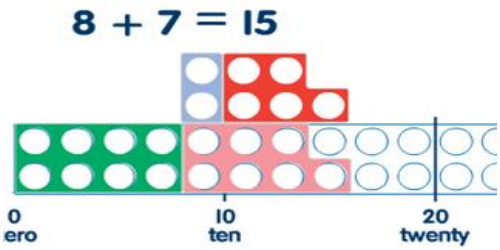


Dual washing line

Practise locating numbers on empty or partially demarcated number lines, eg snake

Importance of using number facts to 'bridge through 10'

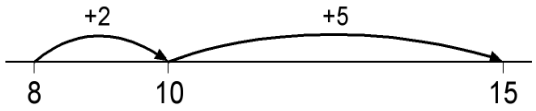
Steps in addition can be recorded on a number line. The steps often bridge through a multiple of 10 and, this is more efficient if children know how to partition 1-digit

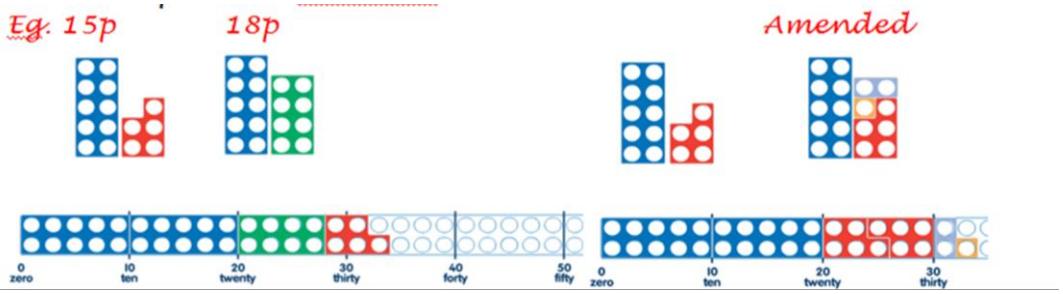


In this example, 7 has been partitioned into 2 and 5 which makes bridging through 10 more efficient

numbers

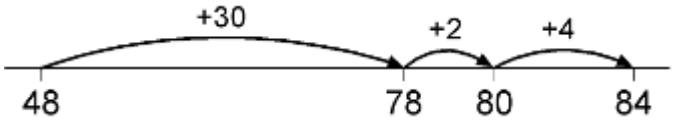
8 + 7 = 15





48 + 36 = 84

or



In these examples, the 6 in 36 has been partitioned into 2 and 4 which makes bridging through 10 more efficient

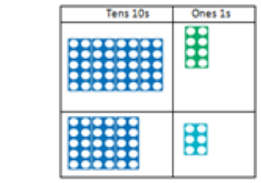
With practice, children will need to record fewer jumps

Stage 3: Partitioning (expanded columnar method)

Partition both numbers into tens and units or hundreds, tens and units (using a grid makes this easier).

48 + 36 = 84

	40	8	
+	30	6	
	70	14	84



148 + 36 = 184

	100	40	8	
+		30	6	
	100	70	14	184

This builds on children's mental maths skills of partitioning and recombining

40 + 30 = 70

8 + 6 = 14

48 + 36 = 84

Extend for 3 digits, use place value counters

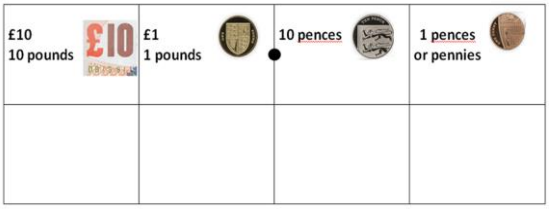
Stage 4: Efficient (column method)

$$\begin{array}{r} 48 \\ +\ 36 \\ \hline 84 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 148 \\ +\ \ 36 \\ \hline 184 \\ \hline 1 \end{array}$$

$$\begin{array}{r} 48.56 \\ +\ 32.23 \\ \hline 80.79 \\ \hline 1 \end{array}$$

Children should be encouraged to estimate their answers first



Column addition remains efficient when used with larger whole numbers or decimals, and when adding more than two numbers, once learned, the method is quick and reliable.

Subtraction

Written methods for Subtraction

It is important that children's mental methods of calculation are practised on a regular basis and secured alongside their learning and use of written methods of subtraction.

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use a written method accurately and with confidence.

Children are taught and acquire secure mental methods of calculation and one written method of calculation for subtraction which they know they can rely on when mental methods are not appropriate.

This policy shows the possible stages of each written method for subtraction, each stage building towards a more refined method.

There are some key basic skills that children need to help with subtraction, which include:

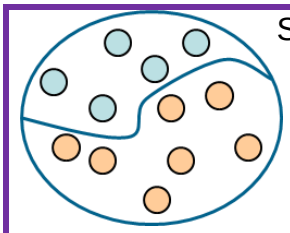
- counting
- estimating
- recalling all addition **pairs** to 10, 20 and 100 along with their inverses (7 + 3 = 10, 10 – 3 = 7, 17 + 3 = 20, 20 – 3 = 17, 70 + 30 = 100, 100 – 30 = 70)
- knowing number **facts** to 10 and their inverses (6 + 2 = 8, 8 - 2 = 6)
- subtracting multiples of 10 (160 - 70) using the related subtraction fact, 16 - 7, and their knowledge of place value
- partitioning two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways (432 into 400 + 30 + 2 and also into 300 + 120 + 12)
- understanding and using subtraction and addition as inverse operations

Using and applying is a key theme and one of the aims of National Curriculum and before children move onto the next stage in written calculation it is important that their skills are broadened through their use and application in a range of contexts, these include:

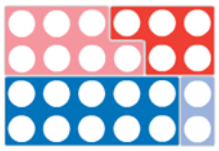
- using inverse
- missing box questions
- using units of measure including money and time
- word problems
- open ended investigations

Stage 1: Practical (taking away)

Prior to recording subtraction steps on a number line, children will work practically with equipment where they are ‘taking away’ a small group from a larger set of objects. As they become more confident, this practical subtraction will be mirrored on a number line so that the two are being done together. This will prepare them for the abstract concept of subtracting numbers rather than objects.

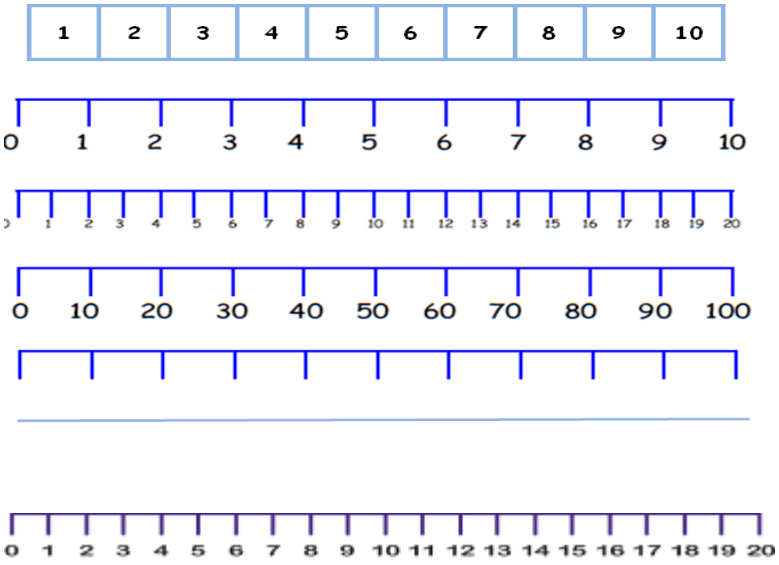


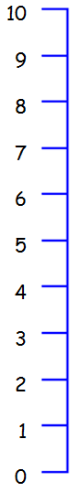
Seeing 12 as made up of 5 and 7



Helps to see the related calculations; 5+7=12, 7+5=12, 12-7 = 5 and 12-5=7 as all in the same diagram

Stage 2 Number tracks and number lines





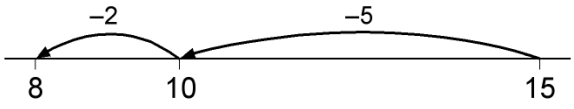
Counting back (to be introduced before counting up)

Steps in subtraction can be recorded from right to left on a number line. The steps often bridge through a multiple of 10 and, this is more efficient if children know how to partition 1-digit numbers.

Partition the second number only

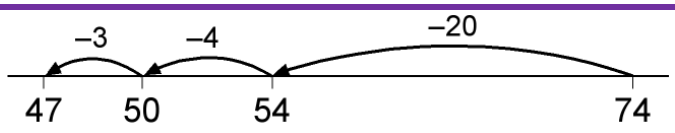
In this example, 7 has been partitioned into 2 and 5 which makes bridging through 10 more efficient

15 – 7 = 8



In these examples, 27 has been partitioned into tens and units then the 7 in 27 has been partitioned into 3 and 4 which makes bridging through 10 more efficient

74 – 27 = 47



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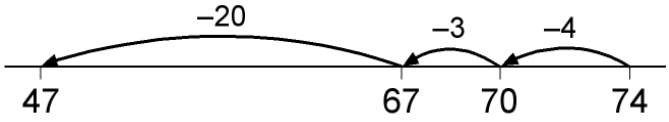
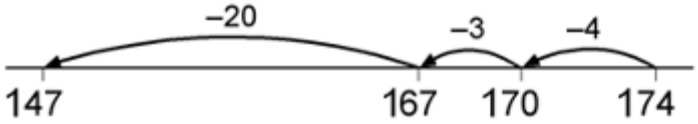


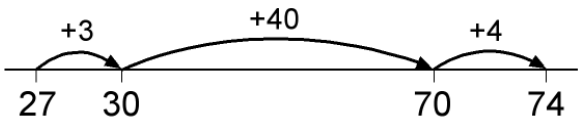
174 – 27 = 147



With practice, children will need to record fewer jumps.

Counting up (to be introduced after counting back)

Steps in subtraction can be recorded from left to right on a number line. The steps often bridge through a multiple of 10.



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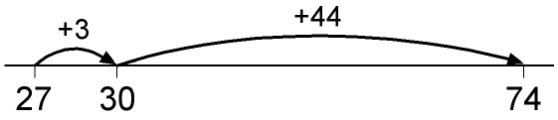


When carrying out money calculations that involve finding change or when calculating time duration, children should use this method

With practice, children will need to record fewer jumps.

They will decide whether to count back or forwards, seeing both as 'finding the difference'. It is useful to ask children whether counting up or back is the more efficient for calculations such as 57 – 12 or 86 – 77.

Stage 3: Partitioning (expanded columnar method)

Partition both numbers into tens and units or hundreds, tens and units (using a grid makes this easier).

	60	1	
	70	4	
−	20	7	
	40	7	47

	100	60	1	
		70	4	
		20	7	
	100	40	7	147

Stage 4: Efficient (column method)

$$\begin{array}{r} {}^{6}\not{7}{}^{1}4 \\ -\ 27 \\ \hline 47 \end{array} \qquad \begin{array}{r} {}^{6}1\not{7}{}^{1}4 \\ -\ 27 \\ \hline 147 \end{array} \qquad \begin{array}{r} 48.56 \\ -\ 32.23 \\ \hline 16.33 \end{array}$$

Children should be encouraged to estimate their answers first

Column subtraction remains efficient when used with larger whole numbers or decimals, once learned, the method is quick and reliable.

Multiplication

Written methods for multiplication

It is important that children's mental methods of calculation are practised on a regular basis and secured alongside their learning and use of written methods of multiplication.

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use a written method accurately and with confidence.

Children are taught and acquire secure mental methods of calculation and one written method of calculation for multiplication which they know they can rely on when mental methods are not appropriate.

This policy shows the possible stages of each written method for multiplication, each stage building towards a more refined method.

There are some key basic skills that children need to help with multiplication, which include:

- counting
- estimating
- understanding multiplication as repeated addition
- recalling all multiplication facts to 12 × 12
- partitioning numbers into multiples of one hundred, ten and one
- working out products (70 × 5, 70 × 50, 700 × 5, 700 × 50) using the related fact 7 × 5 and their knowledge of place value
- adding two or more single-digit numbers mentally
- adding multiples of 10 (60 + 70) or of 100 (600 + 700) using the related addition fact, 6 + 7, and their knowledge of place value
- adding combinations of whole numbers
- understanding and using division and multiplication as inverse operations

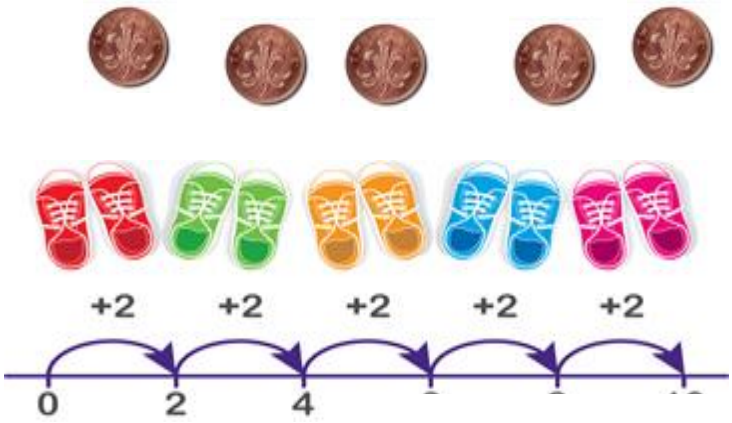
Using and applying is a key theme and one of the aims of National Curriculum and before children move onto the next stage in written calculation it is important that their skills are broadened through their use and application in a range of contexts, these include:

- using inverse
- missing box questions

- using units of measure including money and time
- word problems
- open ended investigations

Stage 1: Practical (repeated addition)

Children will work practically with equipment grouping objects to see multiplication as repeated addition. As they become more confident, this practical grouping of objects will be mirrored on a number line using the vocabulary '*lots of*', '*groups of*', '*how many lots*', '*how many times*' so that the two are being done together. This will prepare them for the abstract concept of multiplying numbers rather than objects.



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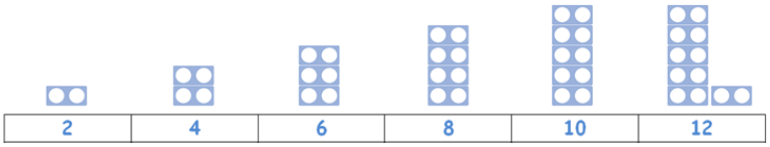


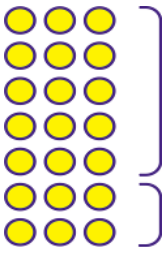
- 2 multiplied by 5
- two, five times
- 5 groups of 2
- 5 lots of 2

5 jumps of 2 on a number line

Stage 2: Practical and pictorial arrays (towards grid method)

Children use arrays to demonstrate their understanding of commutativity for multiplication facts

7 x 3 = 21



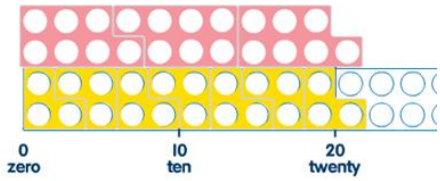
3 x 7 = 21

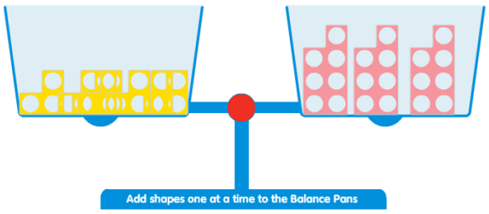
Children use their knowledge of known multiplication tables

This 3 x 7 array can also be seen as 3 x 5 add 3 x 2

Link arrays to fractions, e.g 1/3

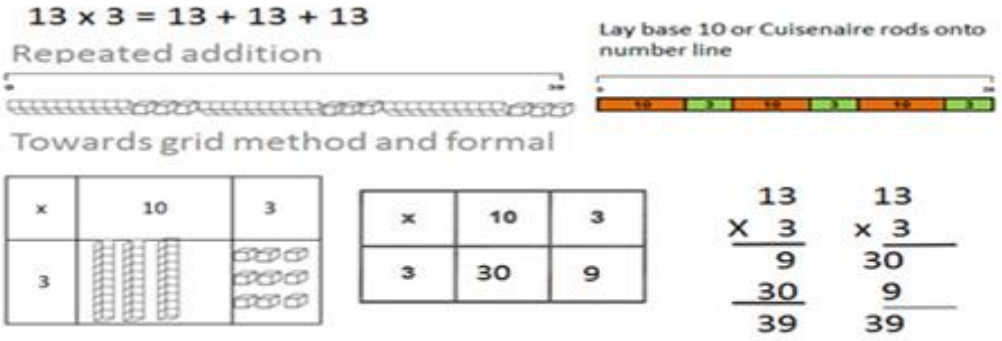
And Numicon





Stage 3: Partitioning (grid method)

Two digit numbers multiplied by ones



24 x 3 = 72

x	20	4	
3			72

24 x 32 = 768

X	20	4	
30	600	120	720
2	40	8	48
			768

X	20	4	
3	60	12	72

Stage 4 Efficient (column method)

24 x 3 = 72

```
  24
x  3
  72
  1
```

1241 x 3 = 3723

```
 1241
x    3
 3723
    1
```

Stage 5 Efficient (column method)

24 x 32 = 768

```
  24
x 32
  48
 720
  1
 768
```

1245 x 13

```
 1245
x  13
 3735
12450
16185
```

In the examples given, it is also correct to multiply starting with the tens digit (i.e. multiplying by the most significant digit first)

Division

Written methods for division

It is important that children's mental methods of calculation are practised on a regular basis and secured alongside their learning and use of written methods of division.

The aim is that children use mental methods when appropriate, but for calculations that they cannot do in their heads they use a written method accurately and with confidence.

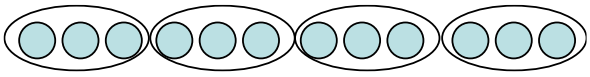
Children are taught and acquire secure mental methods of calculation and one written method of calculation for division which they know they can rely on when mental methods are not appropriate.

This policy shows the possible stages of each written method for division, each stage building towards a more refined method.

There are some key basic skills that children need to help with division, which include:

- counting
- estimating
- understanding division as repeated subtraction
- partitioning two-digit and three-digit numbers into multiples of 100, 10 and 1 in different ways (432 into 400 + 30 + 2 and also into 300 + 120 + 12)
- recalling multiplication and division facts to 12 × 12
- recognising multiples of one-digit numbers and dividing multiples of 10 or 100 by a single-digit number using their knowledge of division facts and place value
- knowing how to find a remainder working mentally, for example, find the remainder when 48 is divided by 5
- understanding and using division and multiplication as inverse operations

Using and applying is a key theme and one of the aims of National Curriculum and before children move onto the next stage in written calculation it is important that their skills are broadened through their use and application in a range of contexts, these include:

- using inverse 
- missing box questions
- using units of measure including money and time
- word problems
- open ended investigations

Division

Stage 1: Practical (sharing)

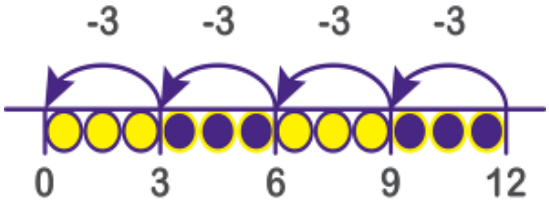
Children will work practically with equipment sharing objects one to one.

12 cakes are shared equally between 3 people

Stage 2: Number lines (grouping)

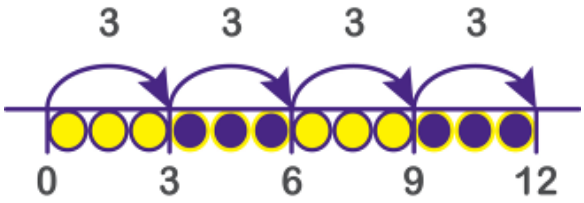
Children will move from sharing objects practically to grouping them, this will be mirrored on a number line, working from right to left so that they see division as repeated subtraction. This will prepare them for the abstract concept of dividing numbers rather than objects.

Each cake box holds 3 cakes, if I have 12 cakes, how many cake boxes will I need?

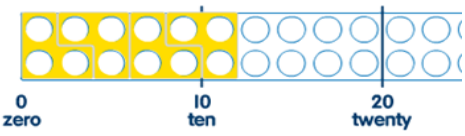


How many times can I subtract 3 from 12?

Using their knowledge of the inverse relationship between multiplication and division, children can use their multiplication tables when grouping on a number line, working from left to right.



How many groups of 3 are there in 12?



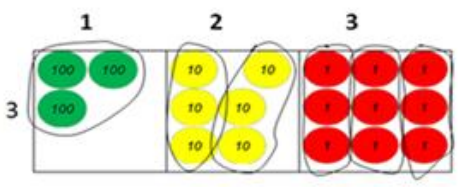
How many 3's are in 12?

First without and then with remainders and ensuring that divisors offer an appropriate level of

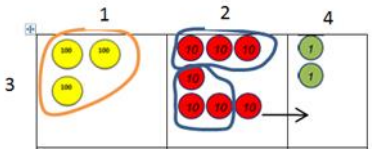
challenge. E.g 37 ÷ 5 How many 5's in 37?

7 remainder 2 2 out of the next group of 5 is $\frac{2}{5}$ = $7\frac{2}{5}$

Stage 3: Short division



372 ÷ 3 = 124



$$3\overline{)372} \quad 124$$

432 ÷ 15 = 28 r12

Importance of jotting table of facts

$$15\overline{)432} \quad 28\tfrac{12}{15}$$

$$15\overline{)432} \quad 28\tfrac{4}{5}$$

remainder as a fraction

$$15\overline{)432} \quad 28_{r12}$$

$$15\overline{)432} \quad 28.8$$

remainder as a decimal

Stage 4: Long division

560 ÷ 24 = 23 r8

$$\begin{array}{r} 23_{r8} \\ 24\overline{)560} \\ 48 \\ \hline 80 \\ 72 \\ \hline 8 \end{array}$$

With long division, there is the opportunity to teach an expanded method first (i.e. chunking)

432 ÷ 15 = 28 r12

$$\begin{array}{r} 28.8 \\ 15\overline{)432.0} \\ 30 \\ \hline 132 \\ 120 \\ \hline 120 \\ 120 \\ \hline 0 \end{array}$$

(12 ÷ 15 = 0.8)
remainder as a decimal

$$\begin{array}{r} 28\tfrac{4}{5} \\ 15\overline{)432} \\ 30 \\ \hline 132 \\ 120 \\ \hline 12 \end{array}$$

(0.8 = $\frac{4}{5}$)
remainder as a fraction

Appendix One

The Calculation Sequence – applying the skills

The Sequence	Prompts	Planning
Provide an estimate for the calculation	Using knowledge of number and the number system, rounding and approximating, make a reasonable estimate.	
Teach the calculation skill	What is the objective you are teaching? Include example questions, increasing in complexity, for both operations.	
Ensure you have taught the inverse	Plan example questions, increasing in complexity. Ensure methods used are in line with school calculation policy. Check that children understand that inverse can also be used to check calculations	
Devise similar calculations but include units	Which units do you need to include? Check the measures applicable to your year group for length, weight, capacity, money and time.	
Complete missing box questions	Include units in these questions as above. The box may cover single digits or an entire number. Vary the position of the missing box within the calculation.	
Complete word problems, 1 and 2 step, including units	Write problems, ensuring the numbers are sized correctly in line with the objective and that units are also used.	

Provide opportunities for open ended investigations	Plan example questions and investigations. Ensure children are working with the correct operations, appropriate size of numbers and use of units for context.	

Resources

All major math resources are centrally located in the maths resource area. Apart from bulky items, all resources are stored in labelled boxes. Teachers are requested to remove the whole box when equipment is being used and to return it promptly to the correct place when no longer required.

In each classroom, teachers must display a Numeracy working wall that reflects current learning and is a useful learning resource. Also have a Maths help desk or toolbox were the children can find resources that will help them with mathematical tasks.

Resources will be audited on an annual basis and any requested resources or damaged resources will be budgeted for on annual Action Plan to maintain accessibility for key learning outcomes.

I.C.T.

I.C.T. is a major resource which is used in mathematics for:

- data handling (use of databases, spreadsheets and graph drawing packages)
- modelling (logo activities)
- practice of skills in a games context (Teaching Tables/ Time/ Money Measures - network resources and Maths Zone KS1 and KS2 - Internet)
- problem solving and investigational activities.
- Clever touch interactive activities.

We are very fortunate that all pupils at Northway have access to their own, personal IPad to aid the creative, technical learning aspect across the curriculum. We use a learning journal called SeeSaw in which pupils can record their learning via videos, pictures, voice notes in which they share with not only teaching staff but also parents, carers, governors and Ofsted.

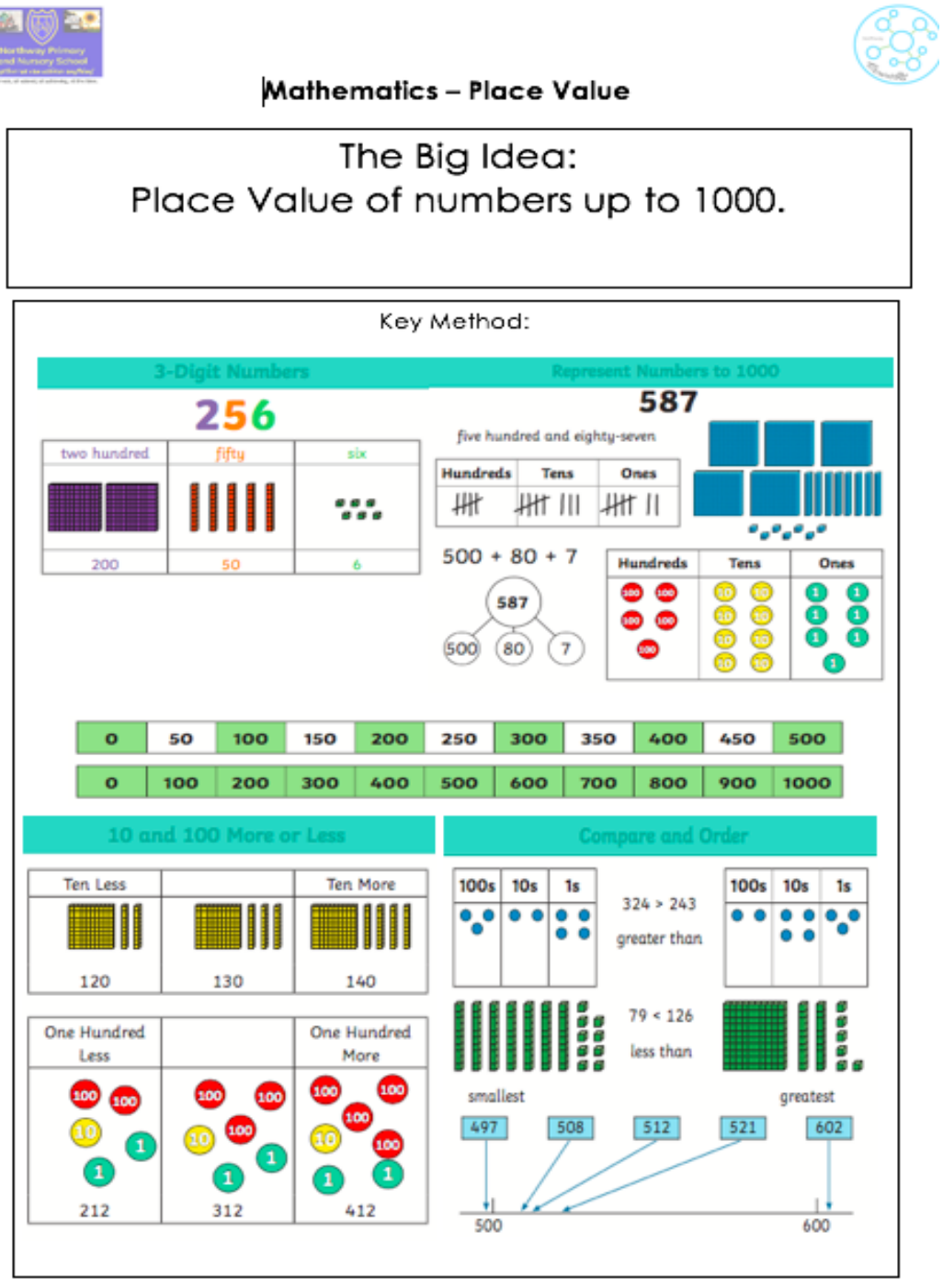
Learners who need more

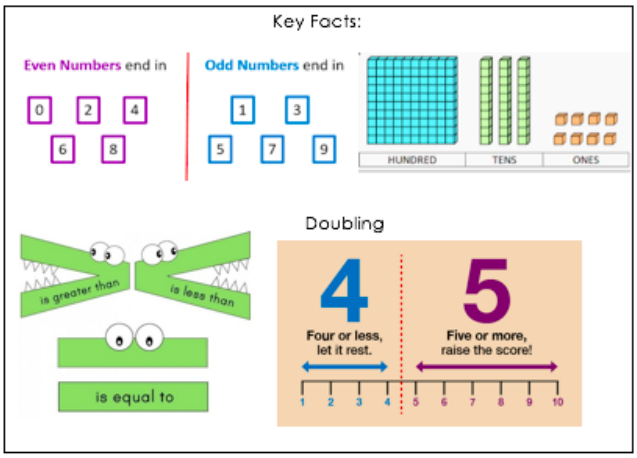
The teaching of mathematics will be in accordance with the present policy for Equal Opportunities. We aim to provide equal and full access to the maths curriculum for all children including pupils with additional educational needs and for the more able. The SAT results will be analysed on a gender/race etc basis. The reasons for any gender/race etc imbalances will be investigated and methods of addressing the imbalance developed.

Knowledge Organisers

In order to aid pupil's knowledge across our progressive maths curriculum, knowledge organisers have been developed for each unit of learning for each cohort. Knowledge organisers provide key learning knowledge such as; key vocabulary, key methods, key facts. Each knowledge organiser will include concrete, pictoral and abstract representations to aid all leaners.

Example: Year 3 Place Value;





Year 3

- partition and recognise place value of numbers upto 1000
- read and write numbers upto 1000
- round number to nearest 10 and 100 upto 1000
- count in multiples of 3,4,8,50 and 100
- compare and order numbers upto 1000

Key Vocabulary:

Hundreds	greater than	base ten
Tens	less than	part whole
Ones	equal to	order
	Partition	numerals
Place Value	digit	represent
Partition	compare	total
Value	estimate	rounding

Year 4

- Partition and recognise place value of numbers upto 10,000
- Read and write numbers upon 10,000
- Round numbers to the nearest 10, 100, 1000
- Count in multiples of 6, 7,9,25,50,100.
- Compare, order and estimate numbers upto 10,000

QR Code:

Schemata:

Across KS1 and KS2	
Place Value	Measurement
Number - Addition	Geometry - Shape
Number - Subtraction	Geometry – Position & Direction
Number - Multiplication	Statistics
Number - Division	**Year 6**
	Ratio and Proportion
Fractions	Algebra
Fraction Decimals	
Fraction Percentages	

Homework

Homework is set weekly using a whole school basic skill online program called 'Mathletics'. All pupils have access to this using their school IPad which they can take home with them each evening, weekend and over holidays. Mathletics basic skill homework assignments is the responsibility of the class teach to set, monitor and review in order to achieve maximum impact of learning needs. Mathletics also offers pupil 'groups' to set pupils into their learning ability including those working towards the expected standard in Maths.

4. Impact

Outcomes

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

KS1: 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.

LKS2: 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.

UKS2: 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.

Assessment

Children's work will be marked according to the agreed school maths and marking policy and their performance, continually assessed in accordance with the Assessing Pupil Progress targets by the teacher using our school planning and assessment tool 'Balance'

Each weekly plan should be assessed and children who achieved significantly more or significantly less than the main body of the class, should be recorded. Reference to these children should be made in teacher's weekly assessments using 'Balance', in order to alert the SLT team to any difficulties during pupil progress meetings.

We make long-term assessments towards the end of the school year, and we use these to assess progress against school and national targets. We can then set targets for the next school year and make a summary of each child's progress before discussing it with parents. We pass this information on to the next teacher at the end of the year, so that s/he can plan for the new school year. We make the long-term assessments with the help of end-of-year tests and teacher assessments. We use the national tests for children in Year 2 and Year 6, plus the optional national tests for children at the end of Years 3, 4 and 5.

5. Progression within the subject

Progression across the year groups Addition

	Typical calculations	Suitable methods
Y1	U+U TU + U (to 20 including zero)	Practical Number line
Y2	TU + U TU + multiples of 10 TU + TU U + U + U	Practical Number line Expanded columnar
Y3	HTU + U HTU + TU HTU + HTU	Number line Expanded columnar Column
Y4	THTU + HTU THTU + THTU	Expanded columnar Column
Y5	THTU.t + THTU.t THTU.th + THTU.th	Expanded columnar Column
Y6	THTU.tht + THTU.tht	Column

Progression across the year groups Subtraction

	Typical calculations	Suitable methods
Y1	U-U TU -U (to 20 including zero)	Practical Number line
Y2	TU -U TU -multiples of 10 TU -TU U -U -U	Practical Number line Expanded columnar
Y3	HTU -U HTU – TU HTU -HTU	Number line Expanded columnar Column
Y4	THTU -HTU THTU -THTU	Expanded columnar Column
Y5	THTU.t -THTU.t THTU.th -THTU.th	Expanded columnar Column
Y6	THTU.tht -THTU.tht	Column

Progression across the year groups Multiplication

	Typical calculations	Suitable methods
Y1	U x U	Practical (repeated addition) Practical and pictorial arrays
Y2	U x U	Practical (repeated addition) Practical and pictorial arrays
Y3	TU x U	Grouping on a number line progressing into Expanded (grid) and into Short
Y4	TU x U HTU x U	Expanded (grid) progressing into Short
Y5	HTU x U THTU x U TU x TU	Expanded (grid) progressing into Short Expanded (grid) progressing into Long
Y6	THTU x U TU x TU HTU x TU THTU x TU U.t x U U.th x U U.t x TU U.t x TU	Short Expanded (grid) progressing into Long Long Expanded (grid) progressing into Short Expanded (grid) progressing into Long

Progression across the year groups Division

	Typical calculations	Suitable methods
Y1	U ÷ U TU ÷ U	Practical sharing Number-line grouping
Y2	U ÷ U TU ÷ U	Practical sharing Number-line grouping

Y3	TU ÷ U	Grouping on a number line progressing into Short
Y4	TU ÷ U HTU ÷ U	Grouping on a number line progressing into Short Short (remainders to be expressed as r)
Y5	HTU ÷ U THTU ÷ U	Short (remainders to be expressed as r, then as a fraction and as a decimal)
Y6	THTU ÷ U HTU ÷ TU THTU ÷ TU U.th ÷ U TU.th ÷ U HTU.th ÷ U THTU.th ÷ U	Short (remainders to be expressed as r, then as a fraction and as a decimal) Long (remainders to be expressed as r, then as a fraction and as a decimal) Short (remainders to be expressed as a decimal)

6. Monitoring and Review

Over the academic year, subject lead will complete x3 book coaching, pupil voice and learning walk monitoring weeks. These will allow subject lead to monitor maths across cohorts, support staff by identifying CPD needs and to celebrate learning whilst also setting achievable targets to all teaching staff in order to maximise pupil progress and outcomes. A summary of book coaching and pupil voice will be produced and fed back to SLT and assessment lead for further analysis is required.

7. Role of the pupil / parent and Subject Lead

Pupils are required to build independence, taking responsibility for their own learning. Pupils are guided to reflect upon their learning and make appropriate amendments to adapt their learning when required and develop perseverance to stretch and challenge their problem solving and reasoning skills accessing mastery level of learning. All pupils can access the maths aims of the National Curriculum and become novice learners.

Working in partnership with parent's, pupils can continue to build and maintain their mathematical knowledge in and outside of the school environment. We encourage parents and pupils to take responsibility for extended learning outside of school as maths in real life is a key learning concepts all children are required to develop.