



A Guide to Maths at Carlinghow Academy 2021-22

This document outlines the expectations of how we teach Mathematics at Carlinghow. It includes the key strategies we use and what Mathematics looks like in the school.

This guide includes information about the following:

- ▶ Using White Rose Maths Schemes of Learning
- ▶ Using Target Tracker
- ▶ Unit Front Covers
- ▶ Assessment
- ▶ Coloured Boxes
- ▶ Concrete, Pictorial and Abstract
- ▶ Resources
- ▶ Differentiation
- ▶ NRich
- ▶ Working Walls
- ▶ Times Table Rockstars
- ▶ Think Pink/ Next Steps
- ▶ Book Scrutiny Feedback
- ▶ Making Maths Exciting
- ▶ Cross-Curricular Maths
- ▶ Three Before Me
- ▶ SeeSaw
- ▶ Mathematical Fluency Appendix 1 & 2

White Rose Schemes of Learning

1. Yearly Overview

A yearly overview for each year group has been slightly adapted from the White Rose Scheme to coincide with the Carlinghow School Calendar and has taken into account of the first two weeks of 'Learning Recovery'. There are Consolidation weeks which allow for a re-visit to key learning objectives previously covered.

This years scheme has taken into account the possibility of learning which may have fallen behind because of objectives not covered during the Summer term of 2020. You may find that children are accessing the objectives comfortably and therefore if your class is secure in their learning you may decide to move onto their actual year group objectives early.

	Week 01	Week 02	Week 03	Week 04	Week 05	Week 06	Week 07	Week 08	Week 09	Week 10	Week 11	Week 12	Week 13	Week 14
Autumn	Super Hero Mixed Math Topic		Number: Place Value (within 20)				Number: Addition and Subtraction (within 20)				Geometry: Shapes	Number: Place Value (within 20)		
	Complete SAT first for baseline assessment						Repeat SAT. Ensure children have secure targets for intervention to an book ready for Autumn 2 week 8.				Assess and review during week 14			
Spring	Consolidation		Number: Addition and Subtraction (within 20)		Number: Place Value (within 50) (Multiples of 2, 5 and 10 to be included)		Measurement: Length and Height		Measurement: Weight and Volume		End of term week KS2 SAT arrangement test Week KS1 SAT arrangement test Week Data Week			
Summer	Consolidation		Number: Multiplication and division (Recall multiples of 2, 5 and 10 to be included)		Number: Fractions		Geometry: Length and Direction		Number: Place Value (within 1000)		Measurement: Money		Measurement: Time	
											Consolidation and revision period		Assess and Review during week 28	

2. Primary Progression

The progression overviews give an at-a-glance guide to how White Rose curriculum links to the KS1 and KS2 National Curriculum, and how it progresses through topics.

In each of the major topic areas (Number, Measurement, Geometry and Statistics), the curriculum has been broken down into key areas.

For each of these areas, you can then see which NC objectives are covered in that year, together with the term and block in which that objective is first met in the White Rose Maths schemes.

Class Teachers – for each topic, teachers will be able to see exactly what they are meant to cover in their year group, but also what they can expect students to have covered in the previous year and where the learning continues next year. You can use this as an aid for differentiation.

Primary Progression – Place Value

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place Value: Counting	<ul style="list-style-type: none"> count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number Count numbers to 100 in numerals, count in multiples of twos, fives and tens <p>Autumn 1 Autumn 4 Spring 2 Summer 4</p>	<ul style="list-style-type: none"> count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward <p>Autumn 1</p>	<ul style="list-style-type: none"> count from 0 in multiples of 4, 6, 10 and 100, and 10 or 100 more or less than a given number <p>Autumn 1 Autumn 3</p>	<ul style="list-style-type: none"> count in multiples of 6, 7, 9, 25 and 1000 count backwards through zero to include negative numbers <p>Autumn 1 Autumn 4</p>	<ul style="list-style-type: none"> count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000 count forwards and backwards with positive and negative whole numbers, including through zero <p>Autumn 1</p>	
Place Value: Represent	<ul style="list-style-type: none"> identify and represent numbers using objects and pictorial representations read and write numbers to 100 in numerals read and write numbers from 1 to 20 in numerals and in words <p>Autumn 1 Autumn 4 Spring 2 Summer 4</p>	<ul style="list-style-type: none"> read and write numbers to at least 100 in numerals and in words identify, represent and estimate numbers using different representations, including the number line <p>Autumn 1</p>	<ul style="list-style-type: none"> identify, represent and estimate numbers using different representations read and write numbers up to 1000 in numerals and in words <p>Autumn 1</p>	<ul style="list-style-type: none"> identify, represent and estimate numbers using different representations read Roman numerals to 100 in CI and know that over time, the numeral system changed to include the concept of zero and place value <p>Autumn 1</p>	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 and determine the value of each digit read Roman numerals to 1000 (M) and recognise years written in Roman numerals <p>Autumn 1</p>	<ul style="list-style-type: none"> read, write, order and compare numbers up to 10 000 000 and determine the value of each digit <p>Autumn 1</p>



Top tip !

Use the termly overview to support ongoing assessments on Target Tracker, to check where children's strengths and gaps in mathematical learning lie.

3. Small steps overview

The objectives in each block are broken down into a series of carefully planned small steps. It is recommended teaching the content in the suggested order as the step sequences are designed to gradually develop children's understanding.

Please note: a single small step does not necessarily equate to just one day of teaching. You will need to judge which steps will need just one day and which will demand two or three lessons. Also this year there are lessons which will solely be re-capping from previous years or blocks.

Please use ongoing Assessment for Learning questioning techniques to determine progression.

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

Overview

Small Steps

- 1000s, 100s, 10s and 1s
- Numbers to 10,000
- Rounding to the nearest 10
- Rounding to the nearest 100
- Round to nearest 10, 100 and 1000
- Numbers to 100,000
- Compare and order numbers to 100,000
- Round numbers within 100,000
- Numbers to a million
- Counting in 10s, 100s, 1,000s, 10,000s and 100,000s
- Compare and order numbers to one million
- Round numbers to one million
- Negative numbers
- Roman Numerals to 1000

Notes for 2020/21

Before exploring numbers to 10,000 ensure that children are secure with 1000s, 100s, 10 and 1s.

You may also find it useful to recap rounding to the nearest 10 and 100 separately before expecting children to round to either 10, 100 and 1000

Work on Roman Numerals has been moved to the end of the block as we believe it is important for children to be secure with our own number system before exploring another.



Top tip !

Use the Notes for 2020/21 at the start of each Block, these provide a short overview and suggested starting points before and while teaching the topic.

4. Lesson by Lesson overview

White Rose have provided an overview of all lessons which has been designed to give a clear progression to follow in case a 'Blended Learning' approach is needed. It also includes how the objectives relate to the new DFE/NCTEM ready to progress criteria, released in July 2020. With the related codes in **Bold**. (Please refer to the guidance).

The Primary Progression map highlights the previous learning objectives which will help when planning differentiation for lost learning and intervention.

Resources for each lesson are available through the premium resource on the White Rose Math's Hub. There will be class videos and power points released over the year too.

Please note: Resources will need to be adapted to ensure all children make progress.

Year 3/4 - Autumn Term

Lesson by lesson overview 2020/21



Week	Day	Y3 Topic	Y4 Topic
1	Mon	Represent numbers to 100	Represent numbers to 100
	Tue	Tens and ones using addition	100s 10s and 1s
	Wed	Hundredths	Count in 1000s
	Thu	Numbers to 1,000	Numbers to 1,000
	Fri	Numbers to 1,000 on a place value grid activity	Represent numbers to 10,000 activity
2	Mon	100s, 10s and 1s (1)	1000s 100s 10s and 1s
	Tue	100s, 10s and 1s (2)	Partitioning
	Wed	Number line to 100	Number line to 1,000
	Thu	Number line to 1,000	Number line to 10,000
	Fri	Find 1, 10, 100 more or less	Find 1, 10, 100 more or less
	Mon	Compare objects	Find 1,000 more or less



Top tip!

Use the lesson videos to aid your own professional development.

5. Small Steps - Varied Fluency

There are two pages of content for each small step. The first page has three sections: **Notes and Guidance**; **Mathematical Talk and Varied Fluency**.

The **Notes and Guidance** section briefly outlines the content for each step and highlights links to previous learning.

The **Mathematical Talk** section provides you with STEM questions designed to unpick the structure of the maths and deepen the children's understanding. When children talk about mathematical concepts they develop the vital mathematical language that helps them explain their ideas.

The **Varied Fluency** section contains two or three questions which show concrete, pictorial and abstract methods of developing children's skills. You could use these questions when you model methods for your children. The range of methods means that you may need to break down varied fluency into smaller chunks of modelling over one or more lessons.

Tip! Use the learned Varied fluency methods and use them during short Arithmetic Afternoon sessions, this will help children retain their knowledge and speed up their fluency by acquiring efficient calculation skills.

Please Note: There are sections which relate to previous year objectives, these are highlighted pink in the guidance, these are for recapping on forgotten content or Flagging any missed content during school closures.

Year 6 | Autumn Term | Week 3 to 7 - Number: Four Operations



Add & Subtract Integers

Notes and Guidance

Children consolidate their knowledge of column addition and subtraction, reinforcing the language of 'exchange' etc. After showing confidence with smaller numbers, children should progress to multi-digit calculations. Children will consider whether the column method is always appropriate e.g. when adding 999, it is easier to add 1000 then subtract 1. They use these skills to solve multi-step problems in a range of contexts.

Mathematical Talk

What happens when there is more than 9 in a place value column?

Can you make an exchange between columns?

How can we find the missing digits? Can we use the inverse?

Is the column method always the best method?

When should we use mental methods?

Varied Fluency

Calculate:

$$\begin{array}{r} 34621 \\ + 25734 \\ \hline \end{array}$$

$$\begin{array}{r} 4761325 \\ - 938052 \\ \hline \end{array}$$

$$67832 + 5258$$

$$834501 - 299999$$

A four bedroom house costs £450,000. A three bedroom house costs £200,000 less. How much does the three bedroom house cost? What method did you use to find the answer?

Find the missing digits. What do you notice?

$$\begin{array}{r} 52247? \\ + 375904 \\ \hline 907372 \end{array}$$

Year 5 | Spring Term | Week 4 to 9 - Number: Fractions



Improper to Mixed Numbers

Notes and Guidance

Children convert improper fractions to mixed numbers for the first time. An improper fraction is a fraction where the numerator is greater than the denominator. A mixed number is a number consisting of an integer and a proper fraction.

It is important for children to see this process represented visually to allow them to make the connections between the concept and what happens in the abstract.

Mathematical Talk

How many parts are there in a whole?

What do you notice happens to the mixed number when the denominator increases and the numerator remains the same?

What happens when the numerator is a multiple of the denominator?

Varied Fluency

Whitney converts the improper fraction $\frac{14}{5}$ into a mixed number using cubes. She groups the cubes into 5s, then has 4 left over. $\frac{14}{5}$ is the same as $2\frac{4}{5}$ is the same as $2\frac{8}{10}$

Use Whitney's method to convert $\frac{11}{3}$, $\frac{11}{4}$, $\frac{11}{5}$ and $\frac{11}{6}$ as a mixed number is $2\frac{5}{6}$

Tommy converts the improper fraction $\frac{27}{8}$ into a mixed number using bar models.

Use Tommy's method to convert $\frac{25}{8}$, $\frac{27}{8}$ and $\frac{32}{8}$

6. Small Steps - Reasoning and Problem solving

As highlighted in the 2014 National Curriculum, all children must be able to access fluency, reasoning and problem solving. It is therefore essential that we as teachers provide the support needed for every child to reason and problem solve. Answers are provided to the reasoning and problem solving questions. For open-ended questions there are given a variety of possible answers, but of course our children may come up with alternative solutions of their own. We must always encourage children that their probable solutions are good answers and encourage them to find alternative results. Never say they are wrong. It is encouraged that educators model probable solutions and open them up to discussion.

Reasoning and Problem solving questions are needed to apply children's understanding. Some of the questions are more challenging than others and you should use your professional judgement to decide the level of support our children need to tackle the problems. The examples below highlight a mixture of closed and open problems. These will take different periods of time to complete and in some instances could be the focus for an entire lesson as children investigated a range of solutions. White Rose provide a variety of STEM questions which provide opportunities for assessing children through discussion and verbal feedback, ensure to display them on your Working Wall.

Year 6 Autumn Term Week 3 to 7 - Number: Four Operations	Year 5 Spring Term Week 4 to 9 - Number: Fractions
<h3>Add & Subtract Integers</h3> <h4>Reasoning and Problem Solving</h4> <p>Find the difference between A and B.</p> <p>A = 12000 B = 50500 The difference is 31500</p> <p>Here is a bar model:</p> <p>Possible answer: A = 91255 B = 532000</p> <p>A is an odd number which rounds to 100000 to the nearest ten thousand. It has a digit total of 30.</p> <p>B is an even number which rounds to 500000 to the nearest hundred thousand. It has a digit total of 30.</p> <p>A and B are multiples of 5.</p> <p>What are possible values of A and B?</p>	<h3>Improper to Mixed Numbers</h3> <h4>Reasoning and Problem Solving</h4> <p>Amir says:</p> <p>$\frac{22}{4}$ is less than $\frac{27}{4}$ because 22 is less than 27</p> <p>Do you agree? Explain why.</p> <p>Possible answer: I disagree because $\frac{22}{4}$ is equal to $5\frac{1}{2}$ and $\frac{27}{4}$ is equal to $6\frac{3}{4}$.</p> <p>Spot the mistake</p> <ul style="list-style-type: none"> $\frac{27}{4} = 5\frac{1}{2}$ $\frac{27}{4} = 6$ $\frac{27}{4} = 5\frac{3}{4}$ $\frac{27}{16} = 2\frac{3}{16}$ <p>What mistakes have been made? Can you find the correct answers?</p> <p>Correct answers: <ul style="list-style-type: none"> $5\frac{1}{2}$ (incorrect number of fths) 6 (incorrect whole) $6\frac{3}{4}$ (all have an improper fraction) $2\frac{3}{16}$ (incorrect number of wholes) </p>



Top tip! Use the learned Varied Fluency methods and use them during short Arithmetic Afternoon sessions, this will help children retain their knowledge and speed up their fluency by acquiring efficient calculation skills through regular practice. Add a **Reasoning** or **Problem solving** question for a **CHALLENGE** - children love them!

Using Target Tracker

When assessing children on Target Tracker, assess the units you have taught within that half term. Please ensure you look through children's books to find the evidence of children achieving each objective so that assessments are accurate. **Pre** and **Post** assessments should also be used to inform your judgement.

Target tracker can be used in a range of ways to support the effective teaching of maths.

Statement Overview – This outlines the objectives to be taught in each unit. It shows whether each individual is working towards, has achieved or is working at greater depth for each objective within the unit.

How to access Statement Overview

Primary Reports > Statements > Statement overview > Subject-Mathematics: whole class appears for you to analyse and place interventions.

Gap Analysis – This shows the amount of children who are working towards, have achieved or are working at greater depth for each objective within a unit. This supports the teacher in understanding which objectives still need to be covered when the unit is revisited and can also be used to identify children who need further intervention.

How to access Gap Analysis

Primary Reports > Statements > Gap analysis > Subject-Mathematics > I can statements

(Click on the statement and the names of the children will appear.)

Unit Front Covers

At the beginning of each unit, a unit front cover should be stuck in each child's book. There is a template of a front cover saved on the server in Maths 2020-21 under 'Unit Front Covers' inside the Planning guidance folder. You can use and adapt these accordingly. (please add to the folder)

What to include on unit covers:

- Title of Unit – e.g. Number and Place Value
- Small steps being covered within the unit – these can be taken from WRMH schemes or Target Tracker
- Add pictures of expected criteria if you wish.

Place Value	
Pre Assessment Score	Post Assessment Score
Y2 Stage	Y4 Stage
Number number to 100	Number number to 100
100s and 10s using addition	100s and 10s
100s and 10s using subtraction	100s and 10s
Number number to 1000	Number number to 1000
1000s and 100s using addition	1000s and 100s
1000s and 100s using subtraction	1000s and 100s
Number number to 10000	Number number to 10000
10000s and 1000s	10000s and 1000s
10000s and 1000s using addition	10000s and 1000s
10000s and 1000s using subtraction	10000s and 1000s
Number number to 100000	Number number to 100000
100000s and 10000s	100000s and 10000s
100000s and 10000s using addition	100000s and 10000s
100000s and 10000s using subtraction	100000s and 10000s
Number number to 1000000	Number number to 1000000
1000000s and 100000s	1000000s and 100000s
1000000s and 100000s using addition	1000000s and 100000s
1000000s and 100000s using subtraction	1000000s and 100000s
Number number to 10000000	Number number to 10000000
10000000s and 1000000s	10000000s and 1000000s
10000000s and 1000000s using addition	10000000s and 1000000s
10000000s and 1000000s using subtraction	10000000s and 1000000s
Number number to 100000000	Number number to 100000000
100000000s and 10000000s	100000000s and 10000000s
100000000s and 10000000s using addition	100000000s and 10000000s
100000000s and 10000000s using subtraction	100000000s and 10000000s
Number number to 1000000000	Number number to 1000000000
1000000000s and 100000000s	1000000000s and 100000000s
1000000000s and 100000000s using addition	1000000000s and 100000000s
1000000000s and 100000000s using subtraction	1000000000s and 100000000s

Ensure that positive dialogue is shared with children when providing them with Pre and Post assessment results from End of Block assessments. Use results to guide any intervention needed towards children making progress.

Assessment Pre/Post Assessments

End of Topic assessments are provided by White Rose. These can be found here:

<https://whiterosemaths.com/resources/assessment/primary-assessment/end-of-block-assessments/>

These are to be completed before the topic as a formative assessment, preferably during the first part of the Maths lesson, and repeated soon after the unit is completed as a summative assessment.

You should use the pre-assessment to inform your planning and interventions that will need to be implemented into your planning. If children are unable to answer any questions, pre teaching can occur. If children are able to answer most questions, they will be able to complete more reasoning and problem solving activities.

Please note down the children's pre-assessment score and post-assessment score on your unit front cover each time to show progress.

At the end of the assessment, the children are able to grade their confidence levels within the unit. Please use this to inform your planning.

SEN/ Low attaining children – please use the assessments from a previous year group, depending on the child's level. E.g. if they are a Year 4 child working at a Y2 level, you would use the assessments from Y2. If they score highly on these, they can complete the Y3 assessment.

Their daily work within the unit would reflect the objectives they should be working on.

Match the numerals to the correct word.	
13	Thirty
30	Thirty-three
33	Thirteen

Termly Assessments

At the end of every term, children need to complete a White Rose Maths progress check. There are two papers; an arithmetic paper and a reasoning and problem solving paper.

These tests are to inform your judgements on target tracker – please use these to mark off the objectives on target tracker.

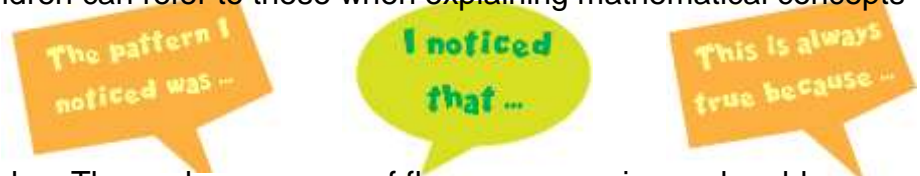
Maths Resources

All classrooms have been provided with resources to aid learning. Teachers need to confer with colleagues in advance if you need to borrow any resources in order to support a topic. Most maths resources are centrally located. If you are aware that resources are unavailable, i.e. are not in school then ensure that you make the Maths Lead aware and they will endeavour to obtain your request if possible. All teachers need to audit their classroom at the start of each term to ensure that they can request what they may need beforehand.

There are lots of online resources in the Maths 2021-22 folder on the server.

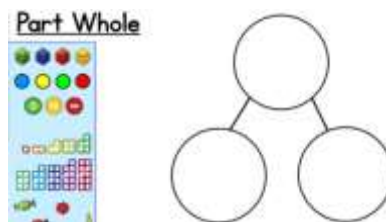
Stem Sentences

A stem sentence provides children with the language they need to access a problem, these need to be on display and children can refer to these when explaining mathematical concepts and solving problems.



Coloured Keys

We use WRMH Schemes to plan. These show a range of fluency, reasoning and problem solving activities that can be used to teach each objective. These schemes can be found on the server in the folder Maths 2021-22.



Children's independent work should be given in different coloured keys; **Blue for fluency**, **Red for Reasoning** and **Purple for Problem Solving**. If you are doing a practical activity or work from a book, then place the corresponding colour in the top corner as circle. These activities should be differentiated in order to support personalised learning. Once a child has completed fluency, they need to move onto reasoning within the lesson; **do not** wait until the next day to complete the next stage of learning. Priority must be given to ensure children complete calculations in their exercise books. Large sections from resources must have a coloured box and should be stuck into children's books and children encouraged to complete the questions in their book, showing their workings etc.

Fluency

This should consist of questions that get progressively harder. When setting these, consider the '3 and move on rule', unless they get progressively harder. NB: You can include word problems in fluency.

(1) $\frac{3}{8} + \frac{2}{8} =$	(2) $\frac{2}{9} + \frac{6}{9} =$	(3) $\frac{3}{4} - \frac{2}{4} =$
(4) $\frac{7}{11} + \frac{4}{11} =$	(5) $1 - \frac{5}{7} =$	(6) $\frac{5}{27} + \frac{8}{27} - \frac{13}{27} =$
(7) $\frac{4}{9} + \frac{8}{9} - 1$	(8) $\frac{5}{7} + \frac{1}{15} + \frac{2}{7} + \frac{14}{15}$	(9) $\frac{3}{4} - \frac{1}{2} + \frac{1}{4}$

Reasoning

This is what children will move onto if they are successful with the fluency. These can be taken from the WRMH Schemes. This can be used as a next step.

Henry has one counter and a place value grid. He says he can make a one, two, three and four digit number. Is he correct? Show this on a place value grid.

1

2

3

Use the number cards to make the following numbers:

_____ is more than 10

_____ is less than 15

_____ is more than 15

_____ is less than 20

Problem Solving

There are two main types of problem solving questions – ones that have a definitive answer and open ended problems that have many answers.

Within the daily mathematics lesson teachers will provide activities to support and challenge children who are abler in maths. They are taught within the daily mathematics lesson and are able to take part at their level through the challenge of the activity, sometimes with the support of a Teaching Assistant and other appropriate activities and resources which the teacher plans into the daily maths lesson.

Greater Depth

Endeavour to meet the needs of higher ability children through careful identification to enable them to show aptitudes and quality of thinking.

Each shape stands for a number.

The numbers shown are the totals of the line of four numbers in the row or column.

▲	♣	▲	○	<input type="text"/>
♣	○	♣	▲	25
○	○	○	○	20
▲	♣	♣	▲	<input type="text"/>
<input type="text"/>	<input type="text"/>	<input type="text"/>	26	

Find the remaining totals.



Concrete, Pictorial and Abstract

The CPA method involves **using actual objects for children to add, subtract, multiply or divide. They then progress to using pictorial representations of the object, and ultimately, abstract symbols.**

Children often find maths difficult because it is abstract. The CPA approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and tangible way.

Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves. Every new abstract concept is learned first with a 'concrete' or physical experience.

Pictorial is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems.

Once a child has demonstrated that they have a solid understanding of the 'concrete' and 'pictorial' representations of the problem, the teacher can introduce the more 'abstract' concept, such as mathematical symbols.

Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, −, x, / to indicate addition, subtraction, multiplication or division.

Problem: There are 8 flowers in the vase. Hannah has 2 flowers in her hand. How many flowers are there altogether?

<u>Concrete</u>	<u>Pictorial</u>	<u>Abstract</u>
Using actual flowers and then moving onto using counters, cubes, Numicon etc. to represent the flowers.	Use drawings of flowers, or pictures of objects such as multi-link blocks or counters, to represent the actual object. You could also use diagrams to support learning such as bar models and part/whole models. Use the Calculation Policy to get ideas.	$8 + 2 =$ When doing abstract, consider moving the equals sign around and using missing numbers in the sum. $\underline{\quad} = 8 + 2$ $2 + \underline{\quad} = 10$ $\underline{\quad} + 8 = 10$

Resources

In order to support the delivery of maths lessons to all pupils the school has a range of resources available. Within the classroom each set of tables should have maths resources available to children at all times, these include basic resources such as number lines, 100 squares, rulers, counters, numicon, etc. Other specific resources (eg, balance scales, meter rulers) are stored in our central resource near the conference room, here equipment is freely available for teachers to borrow as the lesson requires.

Differentiation

At the beginning of each unit, after completing the pre/post assessments, children should be mixed with children who have shown to have ability to support their peers. Teachers should monitor this through 'First Quality Teaching'.

Pre-teaching should be adopted to ensure child has the best possible chance to succeed in future learning objectives. We must remember that a child may have a better understanding of time than they do of division and should never be grouped. All lessons should allow children to work through the objectives and encouraged to engage in completing a range of fluency, reasoning and problem solving activities.

Objectives should be written using the correct mathematical language and they need to be specific to the skills that are being taught. Objectives should be written in child speak using 'I can'.

Here is an example of effective differentiation in Year 3.

Support	Core	Extend
Y2 Objective Write simple fractions. e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	Y3 Objective Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.	Y3 Objective Recognise and show, using diagrams, equivalent fractions with small denominators.
I can find, name and write fractions of a length, shape, set of objects or amount,	I can find and use fractions of numbers.	I can identify and show equivalent fractions.

NRICH

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. *NC2014* Therefore, it is necessary to make our lessons purposeful and involve real life problems into our lessons. Nearly every other task on the NRICH site fits most of the criteria for a rich problem. You can access these links located in the Resources folder "[NRICH PS Curriculum map links.](#)" Each problem provides you with the teachers' notes so you can get a sense of how a lesson might proceed, but, given the freedom to do so, children can take the question in an unexpected direction so you may be surprised at the outcomes. If you can be open to such results, not only will your children learn more and become more independent, but you will be helping them to see mathematics as the creative subject it is.

Number Detective

Age 5 to 11 ★

Calling all detectives! You will need to think creatively, use your reasoning skills and your problem solving strategies to find the mystery number from the list below.

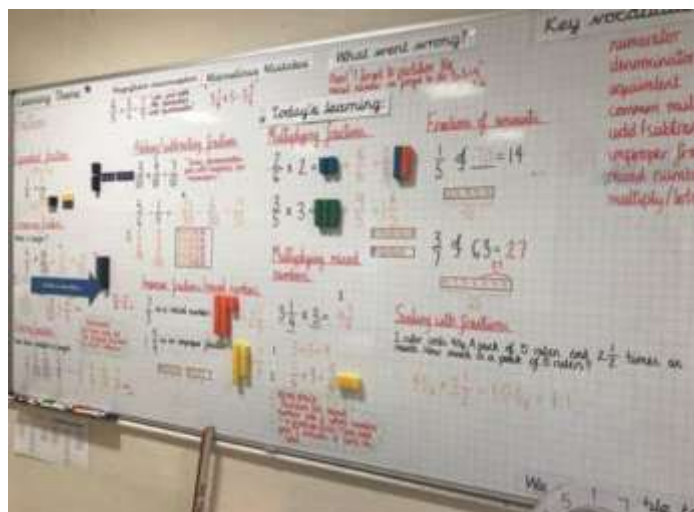


- The number has two digits.
- Both of the digits are even.
- The digit in the tens place is greater than the digit in the ones place.
- The ones digit is not in the three times table.
- The tens digit is not double the ones digit.
- The sum of the two digits is a multiple of five.

Working Walls

Working walls should:

- Be relevant to the unit you are teaching
- Be clear and informative
- Have the key vocabulary for the unit displayed
- Have calculations modelled by the teacher – as per the Calculation Policy
- Show the journey through concrete, pictorial and abstract
- Show the journey through fluency, reasoning and problem solving
- Give prompts and reminders children can use to support their learning



Times Tables

Times Tables Check

All Y4 children will have their multiplication skills formally tested from 2021.

Primary-school children are expected to know all their times tables up to 12x12. Under the current National Curriculum, children are supposed to know their times tables by the end of Y4,

TTRockstars

Key Information

- Each teacher and child creates their own rock star avatar and name.
- Students can earn coins by practising timetables and completing in online competitions. With the coins, they can buy new accessories for their avatar.
- **Setting the tables** – You can set which tables the pupils face each week in the Garage and Arena games by going to My School > Pupil Setup > Set Schedule.
- Children should be completing 10 studio games each half term to update their rock speed. This should then be used on your TTRockstars display.
- There are four game types; Garage, Studio, Arena and Festival. The garage is the best place to improve their score. The studio is the best place for obtaining a rock speed.

For more information on TTRockstars visit:

<https://trockstars.com/page/features>

Type	No. of players	Questions	Coins	Comments
Garage	Solo	Teacher controlled	10	Best place to improve.
Studio	Solo	Up to 12x12	1	Rock speed is calculated here.
Arena	Multi	Teacher controlled	1	Only classmates can play against each other
Festival	Multi	Up to 12x12	1	Open to the whole world.

Think Pinks/ Next Steps

Here are some examples of effective 'Think Pinks' you can use.

- **'Draw it'** Draw a picture to explain or demonstrate how you have worked it out. Be careful with this one - children need to be trained to do this effectively!
- **'What's the question?'** If this is the answer, what is the question? Could there be more than one question?
- **'Empty box question'** What goes in the empty box(es)?
Such as $\underline{\quad} + 4 = 7$, $\underline{\quad} + \underline{\quad} = 9$
- **'Prove it!'** Convince me that you are right.
- **'Tell a story'** Make up a real-life story using your equation/numbers or shapes. Try to use the star words.
- **'Before and after'** What came before? What comes next? Explain how you know.
- **'Find a pattern'** Can you see a pattern in the numbers? Can you see a pattern in the answers? Continuing this pattern, what would happen if...?

Times tables learning in primary school

● Year 1 children are taught counting up in 2s, 5s and 10s (the simplest form of multiplication).

● Year 2 children are introduced to multiplication, division facts and repeated addition for numbers 2, 5 and 10.

● Year 3 is a crucial year for times tables learning. Children learn multiplication facts for the 3, 4 and 8 times tables.

● Year 4 is a 'completing' year for all multiplication facts up to 12 x 12.

● Children are expected to be really confident in all their times tables (up to the 12 times table) by the start of Y5.

- **'What's wrong with this?'** Can you explain what is wrong with the example below and correct the error?
- **'Reason it'** Explain to your partner how you know. Remember to use the star words!
- **'Odd one out'** Find an odd one out and explain why it doesn't fit. Does your partner agree with you? Could another one be the odd one out? Why?

Next Steps ...

Should

- ▶ Move children on to their next step of learning.
- ▶ Challenge the children further.
- ▶ Correct number formation.
- ▶ Address misconceptions.
- ▶ Link to their pre assessment.
- ▶ Link to the objectives in the unit.

Should Not

- ▶ Be more of the same.
- ▶ Move them on too quickly.
- ▶ Give them the answer.
- ▶ Be too basic.
- ▶ Tell children to do corrections.
- ▶ Tell children to complete think pinks.
- ▶ Have spelling mistakes.

Book Scrutiny Feedback

Evidence will be looked for in the following areas. Feedback is given as per our marking policy; green for positive evidence found and pink for next steps.

Fluency, reasoning, problem solving	Concrete, pictorial, abstract	Presentation	Challenge and varied questions	Clear steps in learning-sequence	Marking and feedback-next steps impact	Actions since last scrutiny
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Making Maths Exciting

We want our children to enjoy maths and we know that children learn best when they are engaged and excited about their learning. Real life activities support their problem solving skills. Below are some ideas of how you can 'think outside the box' when planning your maths sessions and make them as practical and active as possible.

Support

Y2 Objective
Write simple fractions.
e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$

I can find, name and write fractions of a length, shape, set of objects or amount, including $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$, and $\frac{3}{4}$. (Fractions)

Core

Y3 Objective
Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.

I can find and use fractions of numbers such as $\frac{1}{4}$ of 8 = 2 and $\frac{3}{4}$ of 8 = 6.

- Food!
- Cubes
- Bar model
- Pictures
- Computer games
- Matching activities
- Card games e.g. snap
 - Loop cards
 - Tarsia Puzzles

Cross-Curricular Maths

Some of your topics throughout the year will provide lots of opportunities to explore and teach real life mathematics. Please complete at least two cross curricular maths sessions each half term. These can be done during any lesson, it does not have to be in just maths or topic lessons. Cross curricular maths should be completed in your Topic book. If this is completed during a maths session, please write a note in each maths book – e.g. “Date + Please see topic book.”

Examples of cross-curricular maths

History – Timelines, finding the difference between dates/ periods of time, Roman Numerals, time, money

Geography – scales, population, shape, data handling, money, co-ordinates

Science – Measurement, data handling, weight

PE – Time, measurement, estimation, data handling, counting

Art – Shape, area and perimeter, angles



- Treasure maps – co-ordinates
- Pirate problem solving
- Time – how long does it take to get to the next island?
- Counting treasure – money and times tables.

Three Before Me

Three Before Me!

Brain

**Box /
Board**

Buddy

Boss

- ▶ These are to promote independent learning in all subjects.
- ▶ These are personalised. Take photographs of your class for each stage.
- ▶ There are speech bubbles that should be displayed around the poster that remind children of what to do for each step. These can be found on the server in the Maths 2020-2021 folder > Three Before Me.
- ▶ Please remind children to use these steps on a regular basis at first so that it becomes second nature.

Using Seesaw in the classroom and Remotely



White Rose Maths

White Rose Maths resources will be used as they are matched to our current maths curriculum model. Children are very used to seeing these resources. These resources can be used by the TA's to support children and for interventions. Lessons using SeeSaw for activities will have the QR code stuck into the children's book.



Oak National Academy

The online lessons are free to all and offer a recorded taught session so that the children can access physical teaching from a teacher and then access work relating to that lesson within the same website. There are also hundreds of lessons specifically aimed at children with SEND needs and requiring additional support.

Any lessons set from Oak Academy will be assigned through the See Saw app.

Opportunities to set maths work through the Seesaw app. In many cases this will link with online lessons from the White Rose Maths resources and from the Oak National Academy resources where possible, children will follow similar or differentiated work to the needs of the child.

(Remote Learning Policy for guidance on setting learning OnLine)