Unit Overview and Guidance
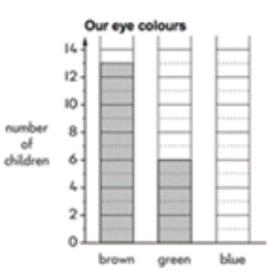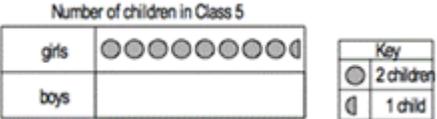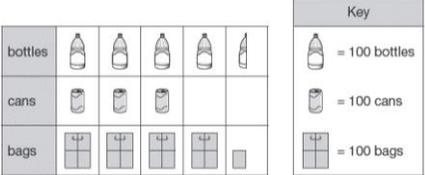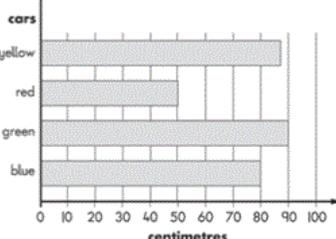
- The exemplification has been taken from the NCETM online 'Resource Toolkit', with additions in order to ensure full coverage.
- Links to the White Rose Maths hubs schemes of work (with questions categorised into the three aims of the national curriculum i.e. fluency, problem solving and reasoning) are hyperlinked to each of the objectives. Many thanks go to the White Rose Maths hub for permission to include their resources.
- The NCETM reasoning questions have also been incorporated into each unit and are identified in pale purple boxes underneath the group of the most relevant objectives.
- The 'big Ideas' sections from the NCETM 'Teaching for Mastery' documents have been included at the start of each unit. Hyperlinks to the full NCETM 'Teaching for Mastery' documents have also been included for easy reference.
- Hyperlinks to NRich activities have also been added to this version. These are found by clicking on the blue buttons like this one $\boxed{1}$ at the bottom of relevant objective.
- Some additional content has been added in order to support mixed-aged planning. Any additional content is in *italics*. Occasionally ~~strikethrough~~ has been used to identify when an objective has been altered and this is primarily where an objective has been split between two units.
- Each unit is sub-divided into sections for ease of planning. Sub-categories in this unit are;
    1. Presenting and interpreting data
    2. Solving problems

	Yr 2	Yr 3	Yr 4
NCETM Teaching for Mastery Questions, tasks and activities to support assessment	**The Big Ideas** Data need to be collected with a question or purpose in mind. Tally charts are used to collect data over time (cars passing the school, birds on the bird table).	**The Big Ideas** Data needs to be collected with a question or purpose in mind. Tally charts are used to collect data over time (cars passing the school, birds on the bird table). They can also be used to keep track of counting.	**The Big Ideas** In mathematics the focus is on numerical data. These can be discrete or continuous. Discrete data are counted and have fixed values, for example the number of children who chose red as their favourite colour (this has to be a whole number and cannot be anything in between). Continuous data are measured, for example at what time did each child finish the race? (Theoretically this could be any time: 67·3 seconds, 67·33 seconds or 67·333 seconds, depending on the degree of accuracy that is applied.) Continuous data are best represented with a line graph where every point on the line has a potential value.
	[Teaching for Mastery Year 2](#)	[Teaching for Mastery Year 3](#)	[Teaching for Mastery Year 4](#)

STATISTICS (STC - 3 weeks)

Strand	Yr2	Yr3	Yr4
Presenting and Interpreting data	**interpret and construct simple pictograms, tally charts, block diagrams and simple tables** **Make tally charts** **Draw pictograms (1-1)** **Draw pictograms (2, 5 and 10)** **Block diagrams** Class 2 make a graph. 5 children have blue eyes. Show this on a graph. More children have brown eyes than green eyes. How many more? 1 2 3 4 5 6 **ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity** **Interpret pictograms (1-1)** **Interpret pictograms (2, 5 and 10)** Look at this pictogram. There are 12 boys in class 5. Show this on the pictogram. How many more girls than boys chose the giraffes? How many more boys chose lions than elephants? Which animal was chosen by the greatest number of children? 1 2 3 4 5	**interpret and present data using bar charts, pictograms and tables** **Pictograms** **Bar charts** **Tables** Process, present and interpret data to pose and answer questions. They use all representations such as Venn and Carroll diagrams, bar charts, pictograms. They collect data quickly onto a class tally chart. Children recognise that a tally involves grouping in fives and that this helps them to count the frequencies quickly and accurately. They produce a simple pictogram and/or bar chart, where a symbol represents 2 units. Children sort and classify objects, numbers or shapes according to two criteria, and display this work on Venn and Carroll diagrams Can you put the all numbers in the correct places? 25 247 7002 49 990 |	odd	**not** odd
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a 3-digit number		
not a 3-digit number		| Class 3 collected litter in the park – How many of each item did they collect? How many more bags did they get than cans? 1 2 3 4 5 6 7 8 9 X	**interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs** **Interpret charts** **Introducing line graphs** **Line graphs** ● Collect data, measuring where necessary. They work with a range of data, such as shoe size and width of shoe across the widest part of the foot, the number of letters in children's names, the width of their hand spans, the distance around their neck and wrist, data from nutrition panels on cereal packets, and so on. ● They decide on a suitable question or hypothesis to explore for each data set they work on. For example, 'We think that…boys have larger shoes than girls', '…our neck measurements are twice as long as our wrist measurements', '…girls' names have more letters than boys' names' or '…children in our class would prefer to come to school by car but they usually have to walk'. ● Children consider what data to collect and how to collect it. They collect their data and organise it in a table. They choose a Venn or Carroll diagram, or a horizontal or vertical pictogram or bar chart to represent the data. Where appropriate, they use the support of an ICT package. They justify their choice within the group so that they can present it. ● They understand that they can join the tops of the bars on the bar-line chart to create a line graph because all the points along the line have meaning.

STATISTICS (STC - 3 weeks)

<table>
<tr><td rowspan="2">Solving Problems</td><td rowspan="2">Solving Problems</td>

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ask and answer questions about totalling and comparing categorical data

Some children rolled toy cars down a slope

How far the cars rolled

How far did the blue car roll?

How much further did the green car roll than the red car?

additional questions:

Which car rolled the furthest?

Make up a question about the red car and the yellow car.

Some children were asked to choose their favourite animal in the zoo. This table shows the results

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solve one-step and two-step questions such as 'How many more?' and 'How many fewer?' using information presented in scaled bar charts and pictograms and tables

Collect, represent and interpret data in order to answer a question that is relevant to them, for example:

- What new addition to the school play equipment would you like?
- Which class race shall we choose for sports day?

They decide on the information they need to collect and collect it efficiently. They collate the information on a tally chart or frequency table, then use this to make simple frequency diagrams such as bar charts, using ICT where appropriate. They discuss the outcomes, responding to questions such as:

- Which items had fewer than five votes?
- Would the table be the same if we asked Year 6?
- How might the table change if everyone had two votes?

Children present their conclusions to others, identifying key points that should be included. They make suggestions as to how this data could be used; for example, they may decide that they need to investigate the price of different equipment or discuss what they need to do to prepare for their chosen race.

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solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Comparison, sum and difference

Undertake one or more of three enquiries:

What vehicles are very likely to pass the school gate between 10:00 am and 11:00 am? Why? What vehicles would definitely not pass by? Why not? What vehicles would be possible but not very likely? Why? What if it were a different time of day? What if the weather were different?
Does practice improve estimation skills? Children estimate the lengths of five given lines and record the estimate, measured length and difference. They repeat the activity with five more lines to see whether their estimation skills have improved after feedback.
What would children in our class most like to change in the school? Children carry out a survey after preliminary research to whittle down the number of options to a sensible number, e.g. no more than five.
Children identify a hypothesis and decide what data to collect to investigate their hypothesis. They collect the data they need and decide on a suitable representation. In groups, they consider different possibilities for their representation and explain why they have made their choice.
In the first enquiry, children use tallies and bar charts. In the second, they use tables and bar charts to compare the two sets of measurements. In the third, they use a range of tables and charts to show their results, including Venn and Carroll diagrams. They use ICT where appropriate.

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<tr><td rowspan="2">Solving Problems</td><td rowspan="2">NCETM Reasoning</td>

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True or false? (Looking at a simple pictogram) "More people travel to work in a car than on a bicycle". Is this true or false? Convince me.

Make up you own 'true/false' statement about the pictogram

What's the same, what's different?

Pupils identify similarities and differences between different representations and explain them to each other

Create a questions Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.

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True or false? (Looking at a bar chart)

"Twice as many people like strawberry than lime".

Is this true or false?

Convince me.

Make up your own 'true/false' statement about the bar chart.

What's the same, what's different?

Pupils identify similarities and differences between different representations and explain them to each other

Create a question

Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.

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True or false? (Looking at a graph showing

how the class sunflower is growing over time) "Our sunflower grew the fastest in July".

Is this true or false?

Convince me.

Make up your own 'true/false' statement about the graph.

What's the same, what's different?

Pupils identify similarities and differences between different representations and explain them to each other

Create a question

Pupils ask (and answer) questions about different statistical representations using key vocabulary relevant to the objectives.

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North Yorkshire County Council

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