

Y2 Personalised Learning Journey

Statistics

NC Objective:

- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity
- Ask and answer questions about totalling and comparing categorical data.

Resources/documents: White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, Garry Hall.org.uk

Real life discussion before teaching: Brainstorm where we see shapes in everyday life. (road signs, building materials, school environment)

Pre-assessment	Assessment tasks	Language Focus
----------------	------------------	----------------

White rose maths assessment

Teaching sequence	Learning tasks	
-------------------	----------------	--





WALT: Make tally charts

Introduce tally charts as systematic way of recording data. Ch can already count in fives and know language of total, altogether, more, less and difference.

Complete the tally chart for Year 2 and Year 3

Year Group	Tally	Total
Year 1		10
Year 2		19
Year 3		
Year 4		17

Dexter makes a tally chart of the animals he saw at the zoo

Animal	Tally
	
	
	
	

Tick one box below that shows all of the animals Dexter saw and explain why the others are incorrect.

Make a tally chart about one of the following topics:


- Equipment in class (scissors, glue etc.)
- Favourite sport
- Favourite fruit
- Ways of getting to school (walk, car, cycle etc.)


What do you notice about the groups? How would we count these? How would you show 6, 11, 18 as a tally? Why do we draw tallies like this? When do we use tallies?

WALT: Draw pictograms 1-1





Use tally charts to produce pictograms. They build pictograms using concrete apparatus such as counters or cubes then move to drawing their own pictures. They need to be able to complete missing column or rows. Use the same picture to represent all the data in the pictogram and line this up carefully. Allow children to see pictograms both horizontally and vertically

Use the tally chart to help you complete the pictogram.

Fruit	Tally	Fruit	
Banana		Banana	
Grape		Grape	
Pear		Pear	
Apple		Apple	

Key:  =

Here is a pictogram showing the number of counters each child has.

Dexter	
Alex	
Mo	
Rosie	

How could you improve the pictogram?


How do you know how many images to draw? What is the same and what is different about these two pictograms? (same data but shown horizontally and vertically) Which pictogram is easier to read? Why? What simple symbol could we draw to represent the data? Why did you choose this?

WALT: Interpret pictograms 1-1





Children use their knowledge of one-to-one correspondence to help them interpret and answer questions about the data presented in pictograms. It is important that children are able to compare data within the pictograms.

Here is a pictogram to show Class 5s favourite t-shirts.

Colour	Tally
Blue	
Green	
Red	
Purple	

Key:  = 1 T-shirt

Here is a pictogram.

Blue	
Red	
Yellow	
Green	

The most popular colour sweet is green.

Do you agree with Eva?





Explain why and correct any mistakes.


What is the pictogram showing us? What can you find out from this pictogram? Can you think of your own questions to ask a partner?

WALT: Draw pictograms (2, 5 and 10)

Children draw pictograms where the symbols represent 2, 5 or 10 items. The children will need to interpret part of a symbol, for example, half of a symbol representing 10 will represent 5 Children count in twos, fives, and tens to complete and draw their own pictograms

Use the tally chart to complete the pictogram.





Pet	Tally	Pet	
Dog		Dog	
Cat		Cat	
Rabbit		Rabbit	
Fish		Fish	


Key:  = 2 animals

Create a pictogram to show who was born in what season in your class.

Use what you know about pictograms to help you.

Here is an example.

Season	Tally
Spring	
Summer	
Autumn	
Winter	


Key:  = 2 children

If a symbol represents 2, how can you show 1 on a pictogram? How can you show 5? How can you show any odd number? When would you use a picture to represent 10 objects? Discuss with children that when using larger numbers, 1-1 correspondence becomes inefficient.

WALT:
Interpret pictograms (2,5 and 10)

Prior learning: Children should have collected their own data previously in tally charts and constructed larger scale pictograms practically. Children also need to be able to halve 2 and 10. Expose ch to both horizontal and vertical pictograms

How many more sparrows are there than robins?
 What is the total number of birds?
 How did you calculate this?
 Can you think of your own questions to ask a friend?

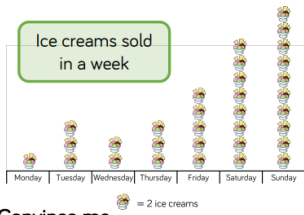


Which is the most popular sport?
 How many children voted for football and swimming altogether?
 What could the title of this pictogram be?

Sport	Children
Football	4 triangles
Tennis	2 triangles
Basketball	3 triangles
Hockey	4 triangles
Swimming	1 triangle

▲ = 2 children

Ice creams sold in a week



Convince me
 There are more ice-creams sold at the weekend than during the rest of the week.

True or False (Why?)
 Three ice creams were sold on Tuesday.

Justify
 If the staff needed to pick one day to have off during the week, which would be the best day and why?

How can we represent 0 on a pictogram? What does the pictogram show? What doesn't it show? What is each symbol worth?

WALT:
Interpret block diagrams

Moving from concrete to pictorial, children build block diagrams using cubes and then move to drawing and interpreting block diagrams. Children use their knowledge of number lines to read the scale on the chart and work out what each block represents. Children ask and answer questions using their addition, subtraction, multiplication and division skills.

Class 4 are collecting data about favourite colours.


Colour	Number of children
Red	5
Green	8
Blue	7
Yellow	2

Make a block diagram using cubes to represent the data.
 Now draw the block diagram.
 What will the title be?
 Remember to label the blocks and draw a clear scale.

Split into groups.
 Everyone needs to write their name on a sticky note.
 Use your sticky notes to create a block diagram to answer each question.

- How many boys and how many girls are there in your group?
- Which month has the most birthdays for your group?
- What is your favourite sport?

What other information about your group could you show?



Can you draw a block diagram to represent the data? What will each block be worth? Can you make a block diagram to show favourite colours in your class? Can you create your own questions to ask about the block diagram?

Y3 Personalised Learning Journey

Statistics

NC Objective:

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

Resources/documents: White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, Garry Hall.org.uk

Real life discussion before teaching: surveys and questionnaires

Pre- assessment

Assessment tasks

Language Focus

White rose maths assessment

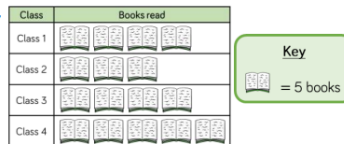
Teaching sequence

Learning tasks

WALT: Read and interpret pictograms

Children build on their understanding of pictograms from Year 2. They continue to read and interpret information in order to answer questions about the data. It is important that children understand the value of each symbol used and what it means when half a symbol is used. Children construct pictograms and choose an appropriate key. Encourage children to carry out their own data collection.

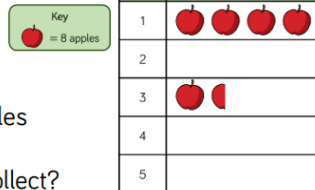
4 classes are recording how many books they read in a week. Here are the results of how many books they read last week.



- Which class read the most books?
- Which class read the least books?
- How many more books did Class 4 read than Class 2?

Complete the pictogram using the information.

- Group 2 collected 40 apples.
- Group 4 collected half as many apples as Group 1
- Group 5 collected 20 more apples than Group 3



How many apples did each group collect?

Ron, Amir and Alex record the scores of six football matches. Unfortunately, Ron spilt paint on them.

Match	Number of goals
1	
2	
3	
4	
5	
6	

Record the results based on what the children remember.

Match 1 had 3 more goals than match 3

Match 6 had 1 less goal than match 2

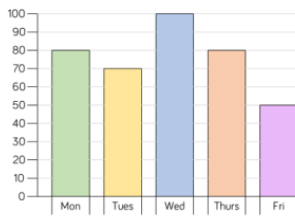
Match 4 had twice as many goals as match 3

What is each symbol worth? What does half of the symbol represent? Is it always possible to use half of a symbol? Why? What other questions could you ask about the pictogram?

WALT:
Interpret information in pictograms and tally charts in order to construct bar charts

Children interpret information in pictograms and tally charts in order to construct bar charts. They interpret information from bar charts and answer questions relating to the data. Children read and interpret bar charts with scales of 1, 2, 5 and 10. They decide which scale will be the most appropriate when drawing their own bar charts.

The bar chart shows how many children attend after school clubs.



Which day is the most popular?
Which day is the least popular?
What is the difference between the number of children attending on Tuesday and on Thursday?
What information is missing from the bar chart?

Here is a tally chart showing the number of children in each sports club.
Draw a bar chart to represent the data.

Sport	Tally	Total
Football		15
Tennis		
Rugby		
Cricket		
Basketball		

Which would be more suitable to represent this information, a bar chart or a pictogram?
Explain why.

Child	Number of Skips in 30 Seconds
Teddy	12
Annie	15
Whitney	17
Ron	8

WALT: Solve problems by interpreting information from tables

Children interpret information from tables to answer one and two-step problems. They use their addition and subtraction skills to answer questions accurately and ask their own questions about the data in tables.

The table shows the increase in bus ticket prices.

- The cost of Ron's new ticket is 60p. How much was his ticket last year? How much has the price increased by?
- Which ticket price has increased the most from 2016 to 2017? Which ticket price has increased the least?

1 st January	
2016	2017
44p	49p
56p	60p
64p	69p
76p	85p
85p	93p
98p	£1.03
£1.05	£1.11

How many questions can you create for your partner about this table?

Day	Number of hours shop is open
Monday	8
Tuesday	8
Wednesday	4
Thursday	10
Friday	7
Saturday	12

Eva has created a table to show how many boys and girls took part in after school clubs last week.

Day	Boys	Girls
Monday	11	9
Tuesday	18	12
Wednesday	13	11
Thursday	8	8
Friday	9	7

Eva says,



106 boys took part in after school clubs last week.

Is Eva correct?

What's the same and what's different about the pictogram and the bar chart? How does the bar chart help you understand the information? Which scale should we use? How can we decide whether to have a scale going up in intervals of 1, 2, 5 or 10?

What information can we gather from the table? Can you explain to a friend how to read the table? Where do we need to use tables in real life? What other questions could I ask and answer using the information in the table?

NC Objectives:

Year 3

Pupils should be taught to:

- interpret and present data using bar charts, pictograms and tables
- solve one-step and two-step questions [for example 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables

Year 4

Pupils should be taught to:

- interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs
- solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs

Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation, deepening understanding resources Policies (Use of concrete), NCETM mastery assessment docs, past SATs questions. Deepening Understanding TTRS Prodigy Maths Classroom secrets

counters, place value charts.

Real life discussion before/, during teaching: Where do we use measure in real life:

EG: Reading a timetable (bus/train/plane).

Pre- assessment	Assessment tasks	Language Focus
	White rose assessment. PUMA assessment.	
Teaching sequence	Learning tasks	Language Focus
1. Interpret charts	<p>Children revisit how to use bar charts, pictograms and tables to interpret and present discrete data. They decide which scale will be the most appropriate when drawing their own bar charts. Children gather their own data using tally charts and then present the information in a bar chart. Questions about the data they have gathered should also be explored so the focus is on interpreting rather than drawing.</p> <p>Key questions:</p> <ul style="list-style-type: none"> • What are the different ways to present data? • What do you notice about the different axes? • What do you notice about the scale of the bar chart? • What other way could you present the data shown in the bar chart? • What else does the data tell us? • What is the same and what is different about the way in which the data is presented? • What scale will you use for your own bar chart? • Why? 	

<p>2. Comparison, sum and difference.</p>	<p>Children solve comparison, sum and difference problems using discrete data with a range of scales. They use addition and subtraction to answer questions accurately and ask their own questions about the data in pictograms, bar charts and tables. Although examples of data are given, children should have the opportunity to ask and answer questions relating to data they have collected themselves.</p> <p>Key questions:</p> <ul style="list-style-type: none"> • What does a full circle represent in the pictogram? • What does a half/quarter/three quarters of the circle represent? • What other questions could we ask about the pictogram? • What other questions could we ask about the table? • What data could we collect as a class? • What questions could we ask about the data? 	
<p>3. Introducing line graphs</p>	<p>Children are introduced to line graphs in the context of time. They use their knowledge of scales to read a time graph accurately and create their own graphs to represent continuous data. It is important that children understand that continuous data can be measured (for example time, temperature and height) but as values are changing all the time, the values we read off between actual measurements are only estimates</p> <p>Key questions:</p> <ul style="list-style-type: none"> • How is the line graph different to a bar chart? • Which is the x and y axis? • What do they represent? • How would you estimate the temperature at 9:30 a.m.? • How would you estimate the time it was when the temperature was 7 degrees? 	
<p>4. Line Graphs</p>	<p>Building from the last step, children continue to solve comparison, sum and difference problems using continuous data with a range of scales. They use addition and subtraction to answer questions accurately and ask their own questions about the data in line graphs. Although examples of data are given, children need to have the opportunity to ask and answer questions relating to data they have collected themselves.</p> <p>Key questions:</p> <ul style="list-style-type: none"> • Is this discrete or continuous data? • How do you know? • What do you notice about the scale of the graph? 	

	<ul style="list-style-type: none">• How could you make sure you read the graph accurately?• What other questions could you ask about the graph?• How many different ways can you fill in the stem sentences?	
--	----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	--

Y5 Personalised Maths Learning Journey Date: WB:		
NC Objectives: <ul style="list-style-type: none"> • solve comparison, sum and difference problems using information presented in a line graph • complete, read and interpret information in tables, including timetables. 		
Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs. Base 10, place value counters, part-whole models, bar models, real-life objects e.g. sweets etc.		
Real life discussion before teaching: Building, constructions, shopping, baking		
Pre- assessment	Assessment tasks	Language Focus
Revision from previous years: <ul style="list-style-type: none"> • interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. • solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs 	White Rose Year 4 Statistics Assessment sheets.	
Teaching sequence	Learning tasks	Language Focus
1. WALT: To interpret charts. WILF: I will use charts and reading of scales to collect information and complete charts.	Model how to read charts by using the scale and intervals on the axis. Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary. Problem solving and reasoning questions. LA- children will read simple charts	Chart, retrieve, axis, scale, interval
2. + WORD PROBLEMS	Model reading and comparing charts. Show a range of different charts. When would we see charts? Why do	Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference

<p>WALT: To solve comparison, sum and difference problems using data.</p> <p>WILF: I will use addition and subtraction to accurately answer questions about data.</p>	<p>we need to know how to read and compare them?</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>WORD PROBLEMS</p> <p>LA- children compare, find totals and difference between different bars on bar charts and other simple charts e.g. pictograms.</p>	
<p>3.</p> <p>WALT: To read line graphs.</p> <p>WILF: I will use my knowledge of scales to read and interpret line graphs.</p>	<p>Model reading line graphs.</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>LA- children will read simple line graphs.</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference</p>
<p>4.</p> <p>WALT: To interpret, draw and label line graphs.</p> <p>WILF: I will use knowledge of horizontal and vertical axis to read, draw and label line graphs.</p>	<p>Recap yesterday's learning. Now look more closely at the different axis</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>LA- children will recap yesterday's learning. Then they will look at comparing and finding difference in line graphs.</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis</p>
<p>5.</p> <p>WALT: To draw line graphs.</p> <p>WILF: I will use knowledge of scales and axis to draw line graphs.</p>	<p>Model how to plot a line graph.</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis</p>

	<p>Problem solving and reasoning questions.</p> <p>LA- children will draw simple line graphs. Their scale will go up in ones and in multiples of ten or 100.</p>	
<p>6. + WORD PROBLEMS</p> <p>WALT: To solve comparison, sum and difference problems using data from line graphs.</p> <p>WILF: I will use addition and subtraction to accurately answer questions about different line graphs.</p>	<p>Model how to make comparisons, sums and differences in line graphs. Discuss when this might be done in real life.</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>WORD PROBLEMS</p> <p>LA- children compare, find totals and difference between different line graphs.</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis</p>
<p>7.</p> <p>WALT: To read and interpret tables.</p> <p>WILF: To use knowledge of columns and rows to read and interpret tables.</p>	<p>What are tables? When do you see them? What can they tell use? Do we still use them?</p> <p>Model how to use the columns and rows to find specific pieces of information</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>LA- children read a range of simple tables. Show them some real-life examples either in books or online. What information can they get from them?</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis, table</p>
<p>8.</p> <p>WALT: To read two-way tables.</p> <p>WILF: I will use knowledge of columns and rows to read and interpret two-way tables</p>	<p>Model how to use the columns and rows to find specific pieces of information from two-way tables.</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis, table</p>

	<p>Problem solving and reasoning questions.</p> <p>LA- where they secure in yesterday's learning? If so, try two-way, if not stick to tables from real-life context.</p>	
<p>9.</p> <p>WALT: To read time tables.</p> <p>WILF: I will read time tables to extract information.</p>	<p>What are time tables? When do you see them? What can they tell use? Do we still use them?</p> <p>Model how to use the columns and rows to find specific pieces of information</p> <p>Once children have started. Have children that are on apply task to come to board to check understanding and give input on how to answer using correct vocabulary.</p> <p>Problem solving and reasoning questions.</p> <p>LA- children read a range of simple time tables. Show them some real-life examples either in books or online. What information can they get from them?</p>	<p>Chart, retrieve, axis, scale, interval, data, compare, comparison, sum, total, difference, horizontal, vertical, axis, table, time table</p>

Y6 Personalised Learning Journey Statistics		
NC Objectives: <ul style="list-style-type: none"> interpret and construct pie charts and line graphs and use these to solve problems calculate and interpret the mean as an average 		
Resources/documents: Ready to Progress Guidance, White Rose Small steps, White Rose Calculation Policies (Use of concrete), NCETM mastery assessment docs, past SATs questions. Base 10. Place value counters.		
Real life discussion before/during teaching : statistics in life- show various examples		
Pre- assessment	Assessment tasks	Language Focus
Revision from previous years:	Various charts and graphs – can children read and interpret them?	Bar chart Pictogram Table Chart Interpret data
Teaching sequence	Learning tasks	Language Focus
WALT: Understand and construct line graphs	Use videos of various activities alongside line graphs to demonstrate what they represent. Show a video activity and children to create their own line graph in pairs.	Line graph Frequency Continuous data
WALT: Interpret line graphs	Give a range of line graphs- what are they showing. Give a range of problems to solve using lines graphs	Line graph Frequency Continuous data
WALT: Interpret pie charts	Teach how to interpret pie charts by relating to fractions EG $\frac{1}{4}$ of the pie chart completed and the whole circle represents 100 therefore $\frac{1}{4}$ of 100 equals 25.	Pie chart Fraction Proportion data
WALT: Construct pie charts	Using previous lesson's teaching, model how to construct a pie chart using given data.	Pie chart Fraction Proportion data
WALT: Calculate the mean of a set of data	Teach how to calculate the mean as an average. Practise: Start with a simple set of data in a table. Apply: Relate back to charts and graphs- finding the data and then calculating the mean average.	Mean Average range
Assessment -mini SATs test on all types of questions		