

TERM 2 OVERVIEW YEAR 6 – Maths

Term 2 – Goodnight Mister Tom

Block 7: Statistics

Guide Time = 2 Weeks (8 lessons)

Assess ment:

WRM End of Block ([here](#))
 WRM End of Term ([here](#))
 Weekly Arithmetic Tests
 2018 & 2019 Practice SATs papers
 AFL, MWB activities and feedback from marking

Pupils should be taught to:

- interpret and construct pie charts and line graphs and use these to solve problems
- calculate and interpret the mean as an average

Links to prior learning (sequencing) and canon book

Canon Book – *Goodnight Mister Tom*

In Year 5 children completed, read and interpreted information in tables, including timetables. They have also had prior knowledge of solving problems using line graphs.
 In LKS2, pupils learnt to interpret and present data using bar charts and pictograms as well as exploring different methods to present discrete and continuous data.

Links to other learning (cross fertilisation)

Science – Children have opportunities to present the results of scientific investigations using graphs, charts and tables. In reading for productivity, children can interpret results using graphs and applying their scientific knowledge to explain and reason about data.

Computing – During their work on spreadsheets, children can explore how to present information in graphs and charts, they can investigate the different scales and ways of presenting data.

PE – Children to think about the mean score over the course of a few games. In rounders, consider the rounders pitch as a whole circle, how many degrees is a whole rounder? Half a rounder? What is the diameter of the pitch? The radius?

History – Children can present information about casualties of war using graphs. Look at the ages of the soldiers who fought for

Very Important Points (VIPs):

Discrete / Continuous Data:

Discrete data is counted and can only be certain values. E.g. the number of pupils in a class. The sum of rolling two dice.

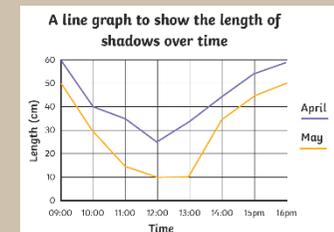


Continuous data is measured and can take any value (within a range). E.g. A person's height, a puppy's weight, the length of a leaf, time in a race etc.



Interpreting Data: This means working out what information is being shown in a table, graph or chart. You can use the information to answer questions about the data.

Line graphs: They are used to show changes to a measurement over time, it is *continuous* data that has points that are joined together to make the line.



Britain, what was the mean age? Draw a pie chart to represent the percentage of the rationing allocation for each food group.

Thematic Questions:

The World Beyond Us:

Which countries are involved with the International Space Station project? Represent the changes in expeditions in a graph or chart. Investigate the number of people who were sent to space by each country- represent this information in a pie chart. What is the mean number of shuttle launches each year from the **Space Kennedy Centre, USA**? Compare this to the mean number of launches from **Tsukuba Space Center, Japan**.

The World Around Us:

Which data would have been tracked during WWII? How might leaders have analysed data to identify an advantage? Is it easier to obtain data now than 100 years ago? Why?

Modern Britain:

Consider the impact on modern Britain of the development of the Wheel; how has this helped our country? If the wheel hadn't been invented would we have pie charts? Would angles be measured in the same way?

Healthy Bodies & Healthy Minds:

How might human development be tracked using statistics? Can having a knowledge of algebra prove beneficial for your health? How did the government decide how much of each ingredient would be suitable for families to live on during rationing? How might algebraic operations be used in the kitchen? Would you need to use equations and formulae when cooking?

Culture:

Social media uses statistics and data to track users' habits online. How might advertisers use this information? Do you think being able to react to online posts is having a positive or negative affect on society? Do you agree or disagree that polls online are a true reflection of how someone feels about something?

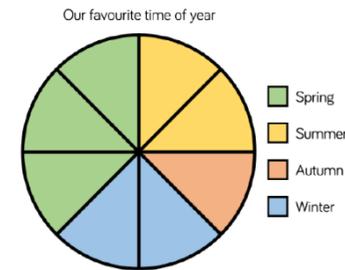
Technology in Action:

How have the advancements in technology helped us to produce and analyse data? How reliable is information produced on computers compared to data produced before their existence? How did previous generations collect, interpret and represent data?

Links to future learning

In KS3 children will continue to develop their knowledge and skills in statistics. Pupils will build on their skills of interpreting and representing data by solving problems with line graphs and bar charts. They will develop their understanding of pie charts further

Pie Charts: This is a circle divided into segments that represent different categories. The size of the segment is proportional to the total amount. Pie charts represent *discrete* data.



Pie charts represent *discrete* data.

When drawing a pie chart, pupils will build on angles around a point totalling 360° to know that

this represents 100% of the data within a pie chart.

To represent data from a frequency table in a pie chart, pupils will need to convert data into degrees. They should know that the total frequency will be equal to 100% and the total degrees will be equal to 360°.

Ice cream flavour	Frequency	Convert to degrees
Strawberry	11	$11 \times 9 = 99^\circ$
Chocolate	8	$8 \times 9 = 72^\circ$
Mint	6	$6 \times 9 = 54^\circ$
Vanilla	9	$9 \times 9 = 81^\circ$
Coffee	6	$6 \times 9 = 54^\circ$
TOTAL	40	360°
$360^\circ \div 40 = 9$		

Mean Average: The mean is the average of a set of data. To find the mean or average, add up all of the values to find the total. Divide the total by the number of values that you added together. This will give you the mean.

Character/ Wider Development ('50 things', cultural capital, skills)

by constructing their own. As well as finding the mean, children will be introduced to the 'range' and 'median' measurements.

Relate and use this knowledge and understanding in real-life contexts and make these relevant and purposeful links:
 Data collection, analysis, interpretation and reporting is used all the time in real-life contexts. Children will be familiar with conducting surveys and polls to solve problems such as the best bicycle to buy or which pet is the easiest to look after.

Join and visit the library: Children can use the libraries' data services to read book reviews and find the popular texts in readers' opinions.

Learn to cook a meal: Children could conduct a survey to show which meal options are the most popular, they can analyse and use the results to make a dish that has the highest approval rates.

Go star gazing: Children can identify the different stars and constellations and plot these on a graph to show which stars were visible over the course of a week.

Travel on a range of different transport: children can use transport timetables to plan a journey, they can look at the stops on a bus timetable and decide the best place to embark/disembark as well as analyse the journey times.

Parts of a circle:

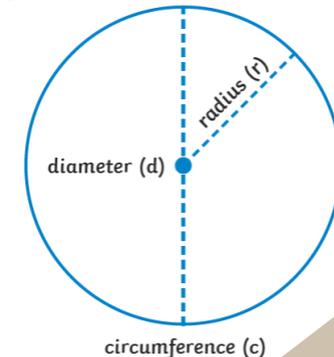
A circle is a 2D shape. The perimeter of a circle is called the **circumference (c)**; it is made of many points that are all the same distance (equidistant) from the centre of the circle.

The **diameter (d)** cuts the circle exactly in half and goes through the centre.

The **radius (r)** is half the length of the diameter and is joined to the centre at one end.

$$r \times 2 = d$$

$$\frac{d}{2} = r$$



Fat Questions:

Describe an example of when you may need to calculate the mean of something?

What is the largest diameter you can think of?

Why is it important to be able to interpret data in real-life? When might you use this in your job or every-day life?

How might line graphs have been used during WWII? Which data might have been represented?

Giving scenarios relating to continuous and discrete data: Which would be the most appropriate representation of a set of data? Why?

OVERVIEW OF TEACHING SEQUENCE

Key Facts / Learning	Learning Focus or Key Question	Learning Outcomes (NC)	Key Words/ Vocabulary	Greater Depth/SEND	Misconceptions	Activities and Resources
Spring 2 Week 11-12 Block 7 Statistics	To read an interpret line graphs To draw line graphs Use line graphs to solve problems Circles Read and interpret pie charts Understand pie charts with percentages Draw pie charts Find the mean	Interpret and construct pie charts and line graphs and use these to solve problems Calculate and interpret the mean as an average Pupils connect their work on angles, fractions and percentages to the interpretation of pie charts. Pupils both encounter and draw graphs relating two variables, arising from their own enquiry and in other subjects.	count, tally, sort, vote, survey, questionnaire, data, database, graph, block graph, pictogram represent group, set list, table, chart, bar chart, frequency table, bar line chart Carroll diagram, Venn diagram line graph pie chart label, title, axis, axes diagram most popular, most common least popular, least common maximum/ minimum value outcome	GD: Ensure these children develop a deep conceptual understanding of statistics to ensure they have the true depth and rigour of knowledge that is a foundation for higher maths. Extend children using the editable WRM reasoning and problem solving resources (click here). Ensure children use mathematical vocabulary to support their reasoning and jottings, working out are included. Deepen the moment questions will be used to delve deeper into the learning focus. NCETM and the National Stem Centre E-library have extension activities and challenges to suit each strand of maths.	This is the first time pupils are exposed to some key statistical knowledge and vocabulary (mean, pie charts & circles). It is important that they master this understanding in order to progress in KS3. Children find it difficult to understand the terms x and y axis, frequency and data. Modelling interpretation of the different graphs/charts and their features. Children find it difficult to read a graph with more than one set of data on. Children try and guess rather than read information accurately. Use a ruler to draw lines to the different sets of numbers and label information clearly. Children do not realise that accurate data is essential; they may estimate rather than accurately work it out. Complete problem solving activities, true	Recapping key concepts and ensuring children are revisiting prior learning is essential. WRM Flashback 4 is a useful support for children at the beginning of sessions, allowing misconceptions to be addressed. DTMs to be created using the following resources and based on CTs AFL of their class/cohort. Further cross-curricular links can and should be made to the 6 themes, for a wider context, which develops children's wider development / character. WRM: click here Classroom Secrets: click here Maths Frame: click here Third Space Maths Hub: click here NCETM: click here Please also see Trust shared for Notebooks and resources to support your teaching.

They should connect conversion from kilometres to miles in measurement to its graphical representation.

Pupils know when it is appropriate to find the mean of a data set.

mean average (mode, median, range as estimates for this)

statistics, distribution

discrete / continuous data

interpret sum, difference, comparison

radius, circumference, diameter, centre, circle

SEND: Ensure QLA has been completed prior to units being taught, consider the use of pre-teaching videos (links to WRM) and the support booklets provided by WRM and Third Space Learning.

Children may be given work with simpler numbers and calculations.

Children will focus on one-step problems.

Children will be encouraged to use practical resources to support their understanding.

Children will have access to modelled examples and definitions of vocabulary.

Use of the NCETM mastery approach document can support teachers when planning their assessment opportunities for children.

or false, sometimes-always-never type reasoning.

Children will not be able to choose an appropriate scale and intervals to use depending on the information they are representing.

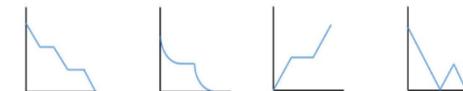
Children do not know what the whole pie chart represents.

Children do not recognise the links between percentages, fractions and angles when looking at pie charts.

Children cannot convert data to degrees to draw their own pie chart.

AFL to be consistently used, to address misconceptions found within own classes / cohorts of children and address where applicable.

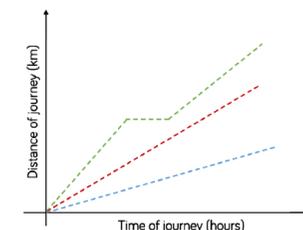
DTM examples:
Which is the odd one out?



The mean number of goals scored in 6 football matches was 4.
Use this information to calculate how many goals were scored in the 6th match:

Match number	Number of goals
1	8
2	4
3	6
4	2
5	1
6	

The graph below shows some of Mr Woolley's journeys.



What is the same and what is different about each of these journeys?

What might have happened during the green journey?

Context (big picture learning):

Mathematics is an important, creative discipline that helps us to understand and change the world. We want all of our children within the Ponterfract Academies Trust to experience all that mathematics has to offer and to develop a sense of curiosity about the subject with a clear understanding. When they leave us we want them to continue their love of maths and use it continuously and positively in their future lives.

We foster a positive 'growth mind-set' attitude and we promote the fact that we believe that all children can achieve in mathematics. We teach for secure and deep understanding of mathematical concepts through manageable, bespoke steps and cross fertilize at every opportunity. VIPs (Very Important Points) are implemented in every lesson to ensure knowledge and skills are revisited and retained over time.

We use mistakes and misconceptions as an essential part of learning and provide challenge through rich and sophisticated reasoning and problem solving activities. At our school, the majority of children will be taught the content from their year group only. They will spend time becoming true masters of content, applying and being creative with new knowledge in multiple ways.

Folder name and link to resources: T:\Primaries\Departments\KS2\Year 5 & 6 Curriculum Planning\Cycle B\Spring - Goodnight Mr Tom\Maths\Year 6\Year 6 Statistics

Year 6 Knowledge Organiser: Algebra

Fat Questions:

- Describe an example of when you may need to calculate the mean of something?
- What is the largest diameter you can think of?
- Why is it important to be able to interpret data in real-life? When might you use this in your job or every-day life?
- How might line graphs have been used during WWII? Which data might have been represented?
- Which would be the most appropriate representation of a set of data? Why?

Key vocabulary

interpret
represent
mean average
discrete / continuous
radius, circumference,
diameter, centre, circle,
data, database,
graph, table, bar chart,
frequency table, line,
graph, pie chart
label, title, axis, axes
most popular, most
common
least popular, least
common

Intent

We aim to develop and progress our skills in statistics in order to equip us with the ability to solve real world problems that require a mathematical solution. With these skills, we can help to improve the world in which we live.

Mean Average

The mean is the average of a set of data. To find the mean or average, add up all of the values to find the total. Divide the total by the number of values that you added together. This will give you the mean.



VIPs:

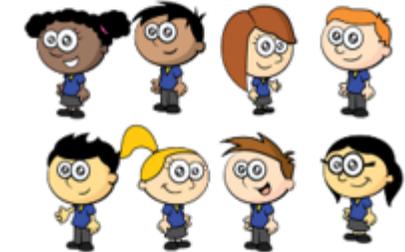
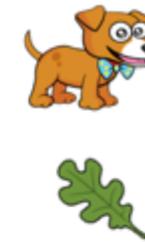
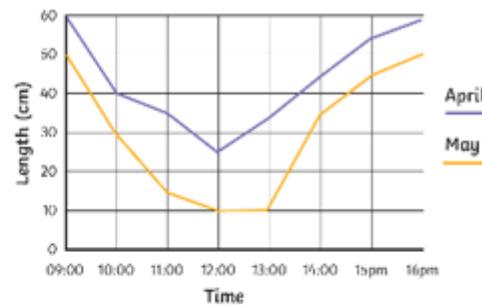
Interpreting Data: This means working out what information is being shown in a table, graph or chart. You can use the information to answer questions about the data.

Line graphs: They are used to show changes to a measurement over time, it is *continuous* data that has points that are joined together to make the line.

Continuous data is measured and can take any value (within a range). E.g. A person's height, a puppy's weight, the length of a leaf, time in a race etc.

Discrete data is counted and can only be certain values. E.g. the number of pupils in a class. The sum of rolling two dice.

A line graph to show the length of shadows over time



Pie Charts This is a circle divided into segments that represent different categories. The size of the segment is proportional to the total amount. Pie charts represent *discrete* data.

When drawing a pie chart, pupils will build on angles around a point totalling 360° to know that this represents 100% of the data within a pie chart.

To represent data from a frequency table in a pie chart, pupils will need to convert data into degrees. They should know that the total frequency will be equal to 100% and the total degrees will be equal to 360° .

A circle is a 2D shape. The perimeter of a circle is called the **circumference (c)**; it is made of many points that are all the same distance (equidistant) from the centre of the circle.

The **diameter (d)** cuts the circle exactly in half and goes through the centre.

The **radius (r)** is half the length of the diameter and is joined to the centre at one end.

