Big Question - Data

AoLE: Mathematics and Numeracy	Subject: Maths	Year: 8

Big Question / Aim / Objective / Concept	Vision (Proposed outcome) / Purpose of curriculum	Prior knowledge / Learners previous knowledge
"Lies, damn lies and statistics". Why is this believed?	Pupils will gain an appreciation of data and the data handling cycle. Pupils will explore how an investigation is planned, conducted and analysed. Pupils will realise the common misconceptions that arise in data handling. Pupils will also explore the different methods of representing data and compare the advantages and disadvantages of different forms of representation. Pupils will finally explore how data can be analysed and the advantages and disadvantages of the different types of average and how range can help describe the data.	Multiplication Division Fractions Addition Subtraction Graphs

What does progression look like in this 'Big Question'?

Progression Indicator	Description of learning (What matters statements)	Student evidence of progression / Knowledge
Excelling	I can explore different sampling methods, including systematic and stratified sampling, understanding the need to select appropriate sampling methods when collecting data. I can extend my methods for representing data, including cumulative frequency, box and whisker, and histograms, to interpret measures of central tendency and measures of spread. I can critically analyse statistics, considering how data is represented, its reliability, and whether and how the data has been manipulated to tell a particular story. I can make informed decisions based on statistical evidence, identifying bias and anomalies. I can make judgments on the outcomes of experimental data. I can use probabilistic arguments, drawing on theory, information, research and experimentation, to make informed decisions.	Represent and interpret grouped quantitative data Compare distributions using charts Identify misleading graphs Find the mean from a grouped frequency table Compare distributions using averages and the range Represent data in two-way tables Explore different sampling techniques and select the most appropriate method. Critique data exploring if it has been manipulated and identifying bias.
Advancing	I can choose a sensible hypothesis to investigate. I have explored the relationship between the type of data. I have collected (including qualitative and quantitative) and how this can be manipulated and represented. I can make informed choices about how to organise and represent data, using a wide range of graphs and charts, including pie charts, frequency diagrams and frequency polygons. I can understand that different averages can be used to compare data, including grouped data, recognising the advantages and disadvantages of each average.	Design a statistical enquiry. Design and evaluate questionnaires. Choose the most appropriate diagram for a given set of data. Compare the different averages and select the most appropriate. Draw and interpret pictograms, bar charts and vertical line charts Draw and interpret multiple bar charts Draw and interpret pie charts

	I can explore trends and anomalies in data sets, investigating correlation between two variables. I can use data to draw conclusions about hypotheses and I have communicated my findings clearly. I can critique my own methods and findings. I can systematically explore all the possible mutually exclusive outcomes of successive and combined events. I can find and use the mean of a simple set of data to explain how the statistics do, or do not, support an argument.	Draw and interpret line graphs Choose the most appropriate diagram for a given set of data Represent grouped discrete data Represent continuous data grouped into equal classes Find the mean from an ungrouped frequency table
Securing	I can collect different types of data to answer a variety of questions that have been posed, demonstrating an understanding of the importance of collecting relevant data. I can represent information by creating a variety of appropriate charts of increasing complexity, including tally charts, frequency tables, bar graphs and line graphs. I can use different scales to extract and interpret information from a range of diagrams, tables and graphs, including pie charts with simple fractions and proportions. I can recognise any trends that are seen. I can recognise how anomalies affect the mean.	Collate relevant data to answer questions posed. Explore the importance of relevant data. Explore different diagrams to display data. Identify trends that occur within the data. Read and interpret grouped frequency tables. Calculate the mode and range of a set of data. Identify outliers
Beginning	I have explored measuring, using counting, measuring equipment and calculating. I can choose the most appropriate method to measure. I can estimate and measure, using non-standard units, before progressing onto standard units. I can use a variety of measuring devices from different starting points. I can investigate, collect and record data found in my environment. I can group sets into categories and I am beginning to communicate the rule(s) I have used. I am beginning to represent and interpret data, using a range of methods.	Use different equipment to measure and collect data from the environment, Identify different types of data. Select appropriate measurements and scales for the data type. Explore different environments and investigate, collect and record a range of data. Categorise data and explain the rule. Displaying data in a range of methods. Read and interpret ungrouped frequency tables.

Authentic learning experiences (Local / National / International)	Skills (Literacy / Numeracy / DCF) / Cross Curricular links
Local links: Explore how the school uses students' preferences to select which subjects to run following the option process in Year 9. National links:	Cross-curricular Links: History uses a range of statistics and examines the validity of these. Geography uses a range of statistics and examines the validity of these. Science uses a range of diagrams to represent different experimental data.

Discover how the Welsh Government can use data to monitor and encourage the use of the Welsh language across Wales. International links: Using the ISRO website, review how the data from the Chandrayaan 3 mission will be used to evaluate the distribution of water on the moon.	DCF: Cross curricular project incorporating numerous DCF skills embedded at the end of Spring term. Use of spreadsheets to explore different representations of data. Literacy: Frayer models and key word spelling tests will assist learners with tier 3 vocabulary. Reasoning and logic will be tested using additional constraints and higher order questioning.

Assessment (How will we know that students have learnt what we taught them?)	
Formative assessment: Teacher circulating Cold calling Mini whiteboards Peer/self assessment tasks Plickers Mathswatch Desmos	Summative assessment: Open book assessment covering all topics.

Evaluation Evaluation (To be completed July 2024)		
Strengths	Areas for Development	Pupil Voice