Subject: Computing	Year: 5 – Spring 2 – **Data & Information – Flat-File Databases**

National Curriculum objectives
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content;
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information.

To begin this unit, the children should have already learnt:	**The learning in this unit will prepare the children to learn these things in the future:**
Year 1	Year 6
Data can be numbers, words or figures. Objects can be labelled using either their names or by describing their properties. Labels can be used to place objects into groups. This helps us to count and compare data easily – computers help us do this.	A spreadsheet is a computer application that allows users to organise, analyse and store data in a table and present information in meaningful graphs and charts. Spreadsheets are most used for organising and presenting finances (for example budgets and finance reports) because users can apply formulas and formatting to perform mathematical processes and make data easier to decipher.
Year 2	
Data can be collected in the form of a tally chart and then progress onto presenting data in the form of pictograms and, finally, block diagrams. The data presented can be used to answer questions.	
Year 3	
Branching databases can help us to identify objects within sets of data and <u>classify</u> the objects into groups, based on what they are or their different attributes.	
Year 4	
Data loggers (which have sensors built into then) and logging software can be used to automatically capture data. We can use data collected draw conclusions in answer to our research questions.	

<u>Key Enquiry Question</u>	**<u>The Big Idea:</u>**
How have you recorded, sorted and ordered your information? Can you explain the terms 'field' and 'record'? What questions can you answer by grouping and sorting data in that way? How does 'how' and 'and' help refine searches? Why is this (chart) helpful to present your data? Are there benefits to using a computer to create a chart?	Flat-file databases organise large amounts of data so that it can be easily added to, amended, stored, and accessed. We can find the data that we need by using the 'search', 'filter' and 'sort' functions.

To achieve ARE, pupils will need to be secure in the following knowledge:

By the end of this unit, children will know:	**Vocabulary:**
• A computer program can be used to organise data;	
• Tools can be used to select data to answer questions;	Information, data, search, label, group, program, similar, properties, different (introduced in Y1).
• Operands can be used to filter data;	
• Ordering data allows us to answer some questions;	Tally, tally chart, present, problem; attributes (introduced in Y2).
• 'AND' and 'OR' can be used to refine data selection;	
• Computer programs can be used to compare data visually;	Branching; database; multiple; classify; structure; present (introduced in Y3).
• We present information to communicate a message.	
	Sensor; logging; analysis; data logger; software; interpret; conclusion (introduced in Y4).
	Sort; filter; records.

By the end of this unit, children will be able to do:	**Useful Resources:**
• Choose different ways to view data;	Access online training courses via the teachcomputing.org website:
• Choose which attribute and value to search by to answer a given question;	• Get Started Teaching Computing in Primary Schools: Preparing to teach 5- to 11-year-olds;
• Ask questions that need more than one attribute to answer;	• Teaching Computing Systems and Networks to 5- to 11-year-olds;
• Choose which attribute to sort data by to answer a given question;	• Teaching Physical Computing to 5- to 11-year-olds;
• choose multiple criteria to search data to answer a given question (AND and OR);	• Teaching Programming to 5- to 11-year-olds.
• Select an appropriate graph to visually compare data;	**Online training courses**
• Choose suitable ways to present information to other people.	Raspberry Pi online training courses
	J2Data sample databases: http://www.j2e.com/help/videos/datags4.
	Flight searching: https://www.expedia.co.uk/Flights

COMPUTING: DATA AND INFORMATION KNOWLEDGE ORGANISER

Overview

Flat-File Databases

-Data is raw numbers and figures. Information is what we can understand from analysing data.

-There are lots of different ways that we can collect, log and interpret data, including by using databases.

-Databases organise data so that it can be easily added to, amended, stored and accessed. Computer databases can allow large amounts of data to be sorted, filtered and edited more easily.

Types of Databases

Database: A database is a collection of organised data that is easily stored and used. Databases often structure data in logical ways (e.g. in columns, rows and tables) so that it can be accessed by those who need it easily. Databases are made up of individuals records, which contain information in different fields (categories).

-**Paper Databases:** Paper databases require the creator to manually write in individual records, and to sort the records in an appropriate order. Paper records can still be useful in small databases, particularly where information is not changing and does not need to be amended frequently. However, most large databases are now stored on computers.	-**Computer Databases:** Many computer programs allow us to create databases, e.g. *j2data* or *Microsoft Excel*. Computer databases have become more popular than paper databases, as data can be easily and quickly added or removed, sorted, filtered, edited, or viewed at any time.

Using a Computer Database

-Computer databases often contain large amounts of data. We can find the data that we need by using the 'search', 'filter' and 'sort' functions. Search functions allow us to type in the exact word/s that we are looking for. This can be useful if we are looking for a particular record.

-If we are looking for records that share certain information we can filter out data by different fields. For example, we filer in the 'age' field for all students aged 23. The database will then present only the students aged 23.

-We can also sort records by the data in particular fields. e.g. we may sort by the students' ages, from youngest to oldest. The youngest student will then appear at the top.

College Enrollment 2016 - 2017			
Student ID	Last Name	Initial	Age
ST348-245	White	R.	21
ST348-246	Wilson	P.	19
ST348-247	Thompson	A.	18
ST348-248	Holt	R.	23
ST348-249	Armstrong	J.	37
ST348-250	Graham	S.	20
ST348-251	McFadden	H.	26
ST348-252	Jones	S.	22
ST348-253	Russell	W.	20
ST348-254	Smith	L.	19

Presenting Data

-Data can be shown visually, by using graphs and charts. This allows users to quickly and easily find answers to the questions that they need. It helps the user to easily see trends and to sequence information.
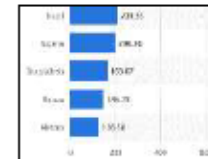
-Charts and graphs can be created by selecting the charts icon and selecting which fields to display in the x-axis and y-axis.

Using Databases

-Remember that databases are used in order to quickly and easily find information. Databases are only able to do this if the data is organised logically into clear records and fields.

-Databases are used in most institutions across the world. Think about: medical records, school student information, flight logs and business accounts.

Important Vocabulary

Information   Data   Collection   Database   Search   Sort   Filter   Software   Fields   Records