Subject: Computing	Year: 4 – Spring 2 – **Data & Information – Data Logging**

National Curriculum objectives
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output;
- 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.

Science – Lower key stage 2/Year 4
- Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers;
- They should learn how to use new equipment, such as data loggers, appropriately. They should collect data from their own observations and measurements, using notes, simple tables and standard units, and help to make decisions about how to record and analyse this data.

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 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. 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 classify the objects into groups, based on what they are or their different attributes.	Year 5 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. Year 6 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.
Key Enquiry Question What questions could be answered by collecting data? What questions could **not** be answered by collecting data? Why is it beneficial to use sensors connected to data loggers to gather data? How does a data logger work to collect data? What does this (data) gathered tell you? What conclusions can you draw from the data you have collected?	**The Big Idea:** Data loggers and logging software can be used to automatically capture data – they have sensors built into then. We can use data collected draw conclusions in answer to our research questions.

To achieve ARE, pupils will need to be secure in the following knowledge:	
By the end of this unit, children will know: • Examples of data that can be logged over time; • Sensors are input devices that can be used for data collection; • A data logger captures 'data points' from sensors over time.	**Vocabulary:** Information, data, search, label, group, program, similar, properties, different (introduced in Y1). Tally, tally chart, present, problem; attributes (introduced in Y2). Branching; database; multiple; classify; structure; present (introduced in Y3). **Sensor; logging; analysis; data logger; software; interpret; conclusion.**
By the end of this unit, children will be able to do: • Use a digital device to collect data automatically; • Choose how often to automatically collect data samples; • Use a set of logged data to find information; • Use a computer program to sort data by one attribute; • Export information in different formats.	**Useful Resources:** Access online training courses via the teachcomputing.org website: ● Get Started Teaching Computing in Primary Schools: Preparing to teach 5- to 11-year-olds; ● Teaching Computing Systems and Networks to 5- to 11-year-olds; ● Teaching Physical Computing to 5- to 11-year-olds; ● Teaching Programming to 5- to 11-year-olds. **Online training courses** Raspberry Pi online training courses

COMPUTING: DATA AND INFORMATION KNOWLEDGE ORGANISER

Overview

Data Logging

-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 data loggers.

-Data loggers and logging software can be used to automatically capture data. We can then draw conclusions in answer to our research questions.
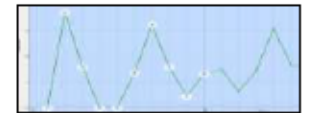
Data Recording

-One way for us to record data is by writing it down. Some data loggers can also record data themselves, which we can download later. Computers can also help us to record data, e.g. by connecting our data loggers to computers and opening data logging software.

-An advantage of this is that computers can record data automatically, meaning that someone does not need to sit waiting for a long period of time. Data loggers can be set to measure at different intervals (points in time).
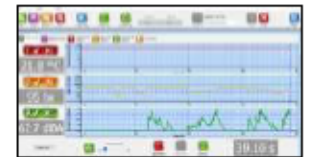
-Data logger software can also be used to show different charts and graphs. This can save the user a lot of time!

Data Collection

Asking Questions: Data gathered over time can be used to answer important questions. For example, the class register can be used to answer questions about children's attendance. Before collecting data, we need to carefully consider which questions we are trying to answer.

-Sensors: Our senses (sight, hearing, smell, taste, touch) detect things in our environment. Computers have input device sensors which help them to sense things.

Some examples are:
-Microphones (sound)
-Camera (light)
-Touchscreen (touch)

- Data Loggers: Data loggers have sensors built into them. They can be used to detect and record data. Data loggers often contain:

-A heat sensor (to record the temperature)
-A light sensor (to record brightness)
-A sound sensor (to record the noise).

Analysing Data

-When scientists collect data, they usually store it so that it can be analysed at any time. The data can also be shared so that other scientists can use it.

-Tables and graphs can be used to present the data in a useful way for reading and understanding it. It is important to be able to see trends as clearly as possible.
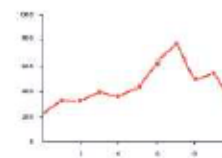
Answering Questions

-Remember that data should be collected for a reason: to answer questions.

-It is very important to ensure that the testing that you do is fair and reliable, otherwise the data that you get back may not give you the accurate answers that you need.

-It is important to interpret your data carefully. You can then write a report detailing what your conclusions are.

Important Vocabulary

Information   Data   Collection   Sensor   Logging   Analysis   Data Logger   Software   Interpret   Conclusion