Year 4 – Data logging

Unit introduction

In this unit, learners will consider how and why data is collected over time. Learners will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Learners will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Learners will spend time using a computer to review and analyse data. Towards the end of the unit, learners will pose questions and then use data loggers to automatically collect the data needed to answer those questions.

Overview of lessons

Lesson	Brief overview	Learning objectives
1 Answering questions	Learners will consider what data can be collected and how it is collected. They will think about data being collected over time. Learners will also think about questions that can and can't be answered using available data, and reflect on the importance of collecting the right data to answer questions.	To explain that data gathered over time can be used to answer questions • I can choose a data set to answer a given question • I can suggest questions that can be answered using a given data set • I can identify data that can be gathered over time

2 Data collection	Learners will build on the idea of collecting data over time, and be introduced to the idea of collecting data automatically using computers such as data loggers. They will also be introduced to the concept that computers can capture data from the physical world using input devices called 'sensors'. Learners will establish that sensors can be connected to data loggers, which can automatically collect data while not attached to a computer.	To use a digital device to collect data automatically • I can explain what data can be collected using sensors • I can use data from a sensor to answer a given question • I can identify that data from sensors can be recorded
3 Logging	Learners will explore how data loggers work. They will record data at set moments in time and draw parallels with the data points that a data logger captures at regular intervals. Learners will use available equipment: thermometers, rain guage and digital weather stations. From this lesson explain to children that they will be expected to collect data in the form of a weather diary over the next 2 weeks, every day.	To explain that a data logger collects 'data points' from sensors over time • I can recognise that a data logger collects data at given points • I can identify the intervals used to collect data • I can talk about the data that I have captured
4 Analysing data	Learners will open an existing data file and use software to find out key information. They will analyse a data file which is a five-hour log of hot water cooling to room temperature.	To recognise how a computer can help us analyse data • I can view data at different levels of detail • I can sort data to find information • I can explain that there are different ways to view data

5 Data for answers	Learners will think about questions that can be answered using collected data. They will choose a question based on the data they have already collected about the weather e.g which days had a high percentage of rain? When the children have created their question, they will learn the skills to input this data into a spreadsheet on Microsoft Excel.	To identify the data needed to answer questions • I can propose a question that can be answered using logged data • I can plan how to collect data using a data logger • I can use a data logger to collect data
6 Answering my question	Learners will access and review the data that they have collected. They will then use the data collected to answer the question that they selected in the previous lesson. Learners will learn how to create a graph to answer their chosen question from the previous lesson. The aim will be for children to see how computers can help use to organise and present data.	To use data from sensors to answer questions • I can interpret data that has been collected using a data logger • I can draw conclusions from the data that I have collected • I can explain the benefits of using a data logger

Progression

This unit progresses learners' knowledge and understanding of data and how it can be collected over time to answer questions. Specifically, it builds on the concept of answering questions with data which is first introduced in the KS1 data and information units. The unit also introduces the idea of automatic data collection. Learners are also introduced to data in tables and graphs, knowledge they will build on in the Year 5 unit (flat file databases) and the Year 6 unit (spreadsheets).

Curriculum links

National curriculum links

Computing – Key stage 2

- 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.

Subject knowledge

This unit focuses on using technology to automatically gather environmental data over time. It refers to data points and logging intervals.

A data logger is a digital device that can collect data over time and store it. Data loggers designed for education will usually have built-in sensors for light, temperature, and sound, as well as the option to connect external sensors.

Input devices allow data to be entered into a computer. Keyboards, mice, and microphones are all input devices.

A sensor is a type of input designed to allow computers to capture data from the physical environment. Sensors can be connected to a computer to capture data about temperature, light, sound, humidity, pressure, etc. A microphone can be used to record audio into a computer, or it can be used as a sound sensor.

Data loggers capture data at given time intervals. The interval is a regular time period between each data capture and can vary according to the experiment. For example, if data is being logged for a week, the interval might be every hour.