# 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.

This unit is designed around the use of a TTS data logger. Your school may not have the same data loggers as those used in this unit, or may not have any data loggers at all. If you don't have access to data loggers, a lot of the activities can be completed using tablet computers and apps such as Google Science Journal. Whichever data logging solution you have available, you should be able to address the learning objectives in the unit.

## 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 | To explain that data gathered over time can be used to answer questions |

| | | |
|---|---|---|
| | available data, and reflect on the importance of collecting the right data to answer questions. | • I can choose a data set to answer a given question<br>• I can suggest questions that can be answered using a given data set<br>• 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<br>• I can explain what data can be collected using sensors<br>• I can use data from a sensor to answer a given question<br>• 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 data loggers away from a computer, then they will connect the loggers to a computer and download the data. | To explain that a data logger collects 'data points' from sensors over time<br>• I can recognise that a data logger collects data at given points<br>• I can identify the intervals used to collect data<br>• 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<br>• I can sort data to find information<br>• 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 to focus on and then plan the data logging process that they need to complete. After learners have completed their plan, they will set up the data loggers to check that their plan will work. This setting up is designed to ensure that the data collection will work, and that learners will have data to use in the next lesson. | To identify the data needed to answer questions<br>• I can propose a question that can be answered using logged data<br>• I can plan how to collect data using a data logger<br>• I can use a data logger to collect data |
| 6  Answering my question | Learners will access and review the data that they have collected using a data logger. They will then use the data collected to answer the question that they selected in the previous lesson. Learners will also reflect on the benefits of using a data logger. | To use data from sensors to answer questions<br>• I can interpret data that has been collected using a data logger<br>• I can draw conclusions from the data that I have collected<br>• 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).

Please see the learning graph for this unit for more information about progression.

## 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.

## Assessment

Formative assessment opportunities are provided throughout each of the lesson plan documents. For summative assessment, please see the assessment rubric document for this unit.

# 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.

You should be aware that 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.

You should also be aware that 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.

Enhance your subject knowledge to teach this unit through the following training opportunities:

**Online training courses**
If you are a teacher in England:
- Raspberry Pi Foundation online training courses (filter by online courses)
- Get Started Teaching Computing in Primary Schools: Preparing to teach 5 - 11 year olds
- Teaching Data and Information to 5- to 11-year-olds

If you are not a teacher in England:
- Raspberry Pi Foundation online training courses
- Get Started Teaching Computing in Primary Schools: Preparing to teach 5 - 11 year olds
- Teaching Data and Information to 5- to 11-year-olds

**Face-to-face courses**

- [National Centre for Computing Education face-to-face training courses](#) (filter by face-to-face or live remote)

Resources are updated regularly — the latest version is available at: [ncce.io/tcc](#).

This resource is licensed under the Open Government Licence, version 3. For more information on this licence, see [ncce.io/ogl](#).