# **Lesson** 5**:** Data for answers

## Introduction

In this lesson, pupils will think about questions that can be answered using collected data. Pupils will choose a question to focus on and then plan the data logging process that they need to complete. After they 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 pupils will have data to use in Lesson 6.

## Learning objectives

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

## Key vocabulary

Data, data logger, logged, collection

## Preparation

**Subject knowledge:**

* You should be aware of questions that could be answered using a data logger in school. The data loggers should be used to log data over time, rather than being used to take individual readings. Pupils will think of questions that may be able to be answered using logged data, and those questions will require filtering to ensure that they are achievable.
* You should be aware of how and where data loggers can be set up.

**Note:** In this lesson, pupils will set up experiments to collect data by Lesson 6. Ensure that pupils can collect data between lessons in accordance with their data collection plan; some management of devices and time will be required to allow pupils to collect data at their chosen times.

**You will need:**

* [Slides](https://ncce.io/dat4-5-s) (ncce.io/dat4-5-s)
* Activities:
  + Asking questions: [‘Thinking of questions’ activity sheet](https://ncce.io/dat4-5-a1-w) (ncce.io/dat4-5-a1-w)
  + Data collection plan: [activity sheet](https://ncce.io/dat4-5-a2-w) (ncce.io/dat4-5-a2-w)

## Assessment opportunities

**Activity 1:** You can assess whether pupils can think of questions related to light, temperature, or sound changing over time.

**Activity 2:** You can assess whether pupils can identify a suitable location and setup for their data logging experiment.

**Activity 3:** You can assess whether pupils can test the key aspects of their data logging plan and identify any potential issues.

## Outline plan

Please note that the slide deck labels the activities in the top right-hand corner to help you navigate the lesson.

*\*Timings are rough guides*

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| Introduction (Slides 2–3)  5 mins | **Collecting data to answer questions**  Display slide 2 and introduce the lesson objectives.  Display slide 3 and talk about data collection. Discuss who collects data and why that data is collected, eg the class register is data collected by the school so that they know who is in school. Ask pupils to think, pair, share to discuss data that might be gathered and why. Use the idea of a step counter to start the discussion. Pupils may identify that the wearer wants to be fitter or healthier, etc. |
| **Activity 1**  (Slides 4–5)  15 mins | **Asking questions**  Display slide 4 and tell pupils that in this lesson, they will think of their own questions, and then later, they will use a data logger to help find answers — the data loggers will be used at some point between this lesson and the next lesson. Remind pupils that the data loggers can collect light, temperature, and sound data. Tell pupils that they will spend a few minutes thinking of two questions, which they will then share with the class.  Display slide 5. Show pupils the words on the slide and discuss the two example questions. Provide pupils with the ‘Thinking of questions’ activity sheet and allow time for pupils to write questions.  After 10 minutes, bring pupils back together and ask for question suggestions. Discuss the questions suggested with the class and write a list of potential questions. |
| **Activity 2** (Slides 6–7)  10 mins | **Data collection plan**  **Note:** Pupils can work in groups of two or three to plan and collect data.  Display slide 6. Tell pupils that they now need to plan their data logging activity. Ask pupils to select a question from the class list (or a question that you have approved). Discuss the questions and considerations shown on the slide:   * “I’m going to collect data to answer this question:” — Pupils should select a question from the class list, or another question that they have agreed with you. * “Where does the data logger need to be placed? How does the data logger need to be set up?” — Pupils should identify where the data logger will be placed and whether it needs to be orientated in a particular direction, eg a light sensor facing towards the window. If pupils wish to use an external temperature probe, they should include that. * “When will data collection start? When will data collection stop? How long will data be collected for?” — Pupils should identify the time frame of their data collecting, eg 24 hours, overnight, until X... * “I think the data that I collect will show…” — Pupils should predict what their data will show and add their hypothesis.   **Note:** The data loggers can be manually started and stopped using the buttons on the device. Some management of devices and time will be required to allow pupils to collect data at their chosen times. The loggers could also be connected to a computer and logging could be started and stopped from within the logging software.  Display slide 7 and provide pupils with the ‘Data collection plan’ activity sheet. Ask them to complete it. |
| **Activity 3**  (Slide 8)  10 mins | **Testing time**  Allow pupils time to test the data logger setup in accordance with their plan. Ask pupils to place the logger in their chosen location and set it up as they have planned. Ask them to collect data for a minute or two, and to check that the data that they collect aligns with their expectations. |
| **Plenary**  (Slide 9)  5 mins | **What could go wrong?**  Ask pupils to think, pair, share to consider their planned experiment and the key things that they should double-check as they set their equipment up. For example, is the data logger in the correct location? Is it switched on? Is anything in the way of the sensors, eg blocking the light sensor? |
| **Next time**  (Slides 10–11)  5 mins | Review the assessment and summary slides. |

This resource is available online at [ncce.io/dat4-5-p](http://ncce.io/dat4-5-p). Resources are updated regularly — please check that you are using the latest version.

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