**Electrical conductors**

**Lesson 5: Review & reflection**

**Introduction**

In this final ‘unplugged’ lesson, pupils reflect on their learning during the unit and decompose the task of testing the electrical conductivity of materials using the BBC micro:bit. The pupils construct an algorithm to identify the steps they undertook in the aforementioned process then review their understanding of the terms inputs and outputs.

**Time:** @60 minutes

**Learning objectives**

* To decompose a problem into smaller steps
* To write a flowchart algorithm that uses selection
* To know and identify inputs and outputs

**Materials needed:** A copy of a pupil’s flowchart algorithm for lesson two, copies of flowchart algorithm thinking map (slide 4), large sheets of paper, paper for pupils to record their flowchart algorithms, lesson presentation.

**Lesson summary**

1. Flowchart thinking map (10 minutes)
2. Creating algorithms (40 minutes)
3. Reviewing learning (10 minutes)

**Introduction: Flowchart thinking map (10 minutes)**

* Show pupils an example of a flowchart algorithm they created in lesson two. Ask pupils to identify what is meant by the term algorithm: a set of sequenced instructions, steps or rules for a human to follow to allow them to complete a task or solve a problem (**slide 3**).
* Use **slide 4** to display the start of a thinking map about flowchart algorithms. Give pupils a copy of the same slide and ask them to work with a partner to note down what they know about flowchart algorithms.
* Once pupils have had sufficient time to add to their thinking map, share ideas as a class.

**Creating algorithms (40 minutes)**

* Use **slide 5** to explain to pupils that they are going to write a flowchart algorithm that instructs someone else how to plan, program and use the micro:bit to test if materials are electrical conductors.
* Explain that they are going to use decomposition to help them identify all the steps they undertook to test materials using the micro:bit. Recall what is meant by the term decomposition (see speaker notes).
* Give out large sheets of paper and ask pupils to work with a partner to record all the steps completed in the process. Collect ideas from the pupils and add to a class copy that can be displayed during pupils’ independent work. Once all ideas have been added, invite suggestions on how the tasks can be sequenced.
* Give pupils time to work with a partner to construct a flowchart algorithm to give step by step instructions on how to use the micro:bit to test the electrical conductivity of materials. (An example of what this could look like is on slide 8.)

**Reviewing learning (10 minutes)**

* Display **slide 6** and discuss how to use the Venn diagram. Ask pupils to recall what the terms input and output mean.
* Starting with their experiences in the unit (creating electrical circuits, tinkering with the micro:bit, testing the electrical conductivity of materials) ask pupils to suggest items that can be added to the input, output and the overlap section.
* Ask pupils to think about their own devices and identify further options. If pupils struggle to identify an example of both ask them to think of a tablet screen and identify if this is an input or an output (The screen is both an input and output as touching the screen makes something happen the results of which are viewed on the screen).

**Extension ideas**

Pupils could produce a poster explaining what inputs and outputs and giving examples of both. They could write a blog post, or record a video to show how they have used their micro:bit as electrical conductor testers.

**Differentiation**

**Support:** Pupils can construct the algorithm as a shared writing task led by an adult, or be given starting points for the steps they took.

**Stretch & challenge:** Pupils can be challenged to write a more detailed algorithm which could include more than once decision box.

**Opportunities for assessment**

* Informal assessment of pupils’ understanding of inputs and outputs through whole class discussion.
* More formal assessment of pupils’ flowchart algorithms.