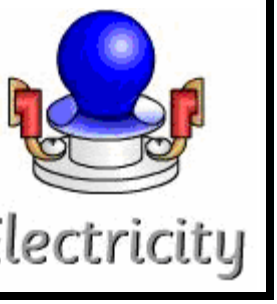
Sample Lesson Plan
The Big Bus Module: Science - Electricity



Title
Using *The Big Bus* ***Science*** **- Electricity** to simulate the construction and performance of simple electrical circuits.

Introduction
Step into the world of science with a visit to a circus. Construct simple circuits using coloured bulbs, batteries and switches to activate robot clowns. Level two introduces resistors.

In this lesson
The children construct simple circuits from on screen component parts. They are challenged to find the correct combination and positioning of components to illuminate a range of bulb configurations at specified degrees of brightness.

Age Range: 6 – 11 years

Lesson Plan

Learning objectives
Having completed this module most children will have developed their ability to:
- Identify the component parts of a simple electrical circuit
- Construct a simple working circuit using a battery, wires bulbs and a switch
- Explain why some circuits work and others do not

Technical preparation
Install *The Big Bus* CD-ROM on to the computer. After a short opening sequence select the button to visit either **Explorers' World or Bo Bear's World.** Open the Information Booklet index and scroll through the available activities. Select **Science - Electricity.**

Additional resources
Batteries, bulbs, bulb holders, insulated wires and switches. (Optional for introduction and extension activities)

Previous experience
Previous, basic work on circuits will provide the children with a sound basis from which to refine their skills using this program.

Introducing the module
Gather the children around a large computer monitor or interactive whiteboard. Recap the **key terminology** the children will encounter in the module. Remind them of the **key components** of an electrical circuit and their functions within that circuit.

Direct the children's attention to the computer monitor or whiteboard then select **Start the activity.** Proceed past the title screen and move through the introductory screens, setting the challenge for the children.

The screen introducing the children to the three degrees of brightness provides an opportunity to discuss the factors that will affect the brightness of the bulbs when their circuit is complete - the thickness of the wires, the number of batteries and the number of bulbs.

The children are now presented with a box of bulbs, wires, switches and batteries that they need to build into a circuit producing a specified range of lights to illuminate the clowns. It is important that they remember that the lights need to be shining **ON** the clowns to activate them.

Point out to the children what each of the graphics represents, using real examples if you have them available. Show the children how to select and drag components onto the circuit board and how, keeping the mouse depressed rotates the item in 90° stages so it can be orientated on the board as the children wish.
Tackle the task presented, involving the children in the choice of components. Discuss the constructed circuit before testing it to see if any individuals can see reasons why it would not work - incomplete circuit, no batteries, no bulbs! Test the circuit to see if it illuminates the robots as desired.

If it does not, work with the children to determine what the problem is, then show them how to return components to the box, move others around or add new ones before testing the circuit again.
Should your circuit work first time, it is worth repeating the exercise with errors to demonstrate this way of modifying their attempt.

After the initial demonstration, and if more than one computer is available, the children could now break into working groups and undertake the module for themselves. Challenge them to complete a specified number of successful circuits in the time available.

Allow the children 15 – 20 minutes to complete the module, and then gather them back together to discuss how they got on. They will have become quicker with each challenge as they became more familiar with handling the components and learnt from experience how to refine their circuit.

Classroom management
A single classroom computer running *The Big Bus*, using a large monitor or interactive whiteboard, is an effective whole class teaching resource. Introduce the module to the whole class before pupils break into their groups.
If you have access to a computer suite this module can be completed as a whole class lesson.
Children should work in groups of two or three as discussing their ideas and testing their predictions is a valuable part of this exercise. If you have access to only one or two computers, pupils will need to complete the module on a rotational basis.

Duration
Each group of children will require approximately 15 - 20 minutes of computer time. The teacher introduction and follow-up time will take approximately 15 minutes and 10 minutes respectively.

Differentiation
All text can be narrated and repeated by clicking on the ear icon, making the module suitable for children of all abilities.

Extending the module
The module can be repeated many times, with randomly presented challenges. Ask children to represent their successful circuits by drawing them using conventional symbols.

Ask the children to recreate their circuits using the classroom stock of components.

Curriculum Information
QCA Scheme of Work for Science: Unit 2F, Unit 4F.
The National Curriculum in England for Science (KS1& KS2)
Sc1: 1b, 2a, 2b, 2c, 2d, 2e.
Sc4: 1a, 1b, 1c.
The Scotland 5-14 Guidelines for Environmental Studies
Science – Knowledge & Understanding – Energy & Forces: Level C.
The Scotland 5-14 Guidelines for ICT
Controlling and Modelling: Level C, D.
The Northern Ireland Curriculum for Science and Technology
Physical Processes –
Electricity: b, d.
The National Curriculum in Wales for Science
Sc4:1.1, 1.2, 1.3, 1.5.