Y6 – Electricity

Lesson 2

Lesson	2 of 5

Key Unit Question:	What is electricity?

Key Lesson Question:	How does voltage in a circuit affect the brightness of a bulb?

Learning Objective

I can associate the brightness of a lamp with the number and voltage of cells used in the circuit.

NC Links

- associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit

Resources

- Presentation
- Differentiated activity sheet (easy/medium)
- Challenge activity sheet
- Next step
- A class set of batteries, battery holder, crocodile clips, bulbs, switches, wires, motors and buzzers.
- Batteries with different voltages.

Teaching Input

- Introduce the learning objective on the title page. Ask the children what the word complete means? What does incomplete mean? What is a complete circuit? Read the information on PPT slide 2/PDF p1.
- Mini task – ask the children to role play how electricity flows around a circuit. What components will you need? How are you going to represent the 'flow' of electricity? Put the children into small groups and allow them time to complete their sketches. Watch each performance in turn. Have the children correctly represented how electricity flows around a complete circuit? What would happen if you added an open switch to your circuit?
- Look at the pictures of the circuits on PPT slide 4/PDF p3. Ask the children to discuss in pairs why the circuits won't work?
- Explain to the children that you can change a circuit by adding more components. Look at the picture on PPT slide 5/PDF p4 where there are two bulbs in the circuit. The circuit looks complete but might not work; challenge the children to think about why this might be. Review answers.
- Ask the children to think about how we measure weight (kg/lbs etc), repeat with other measurements. What unit do we use to measure the amount of electricity? Read the information about volts on the PPT slide7 /PDF p6.
- Explain to the children that if you have more than one bulb in your circuit and they are not lighting up, it could be that your battery is not producing enough voltage. How could you increase the voltage in a circuit? Establish that they could add more batteries. Children to refer back to their table of results to draw conclusions. Establish that increasing the voltage, increases the brightness (and vice versa).
- Complete the recap quiz.

BACKGROUND INFORMATION FOR TEACHERS

A complete circuit can be explained in terms of a continuous flow of electricity through it. Increasing or reducing the voltage of the battery used in a circuit will affect the operation of devices in the circuit (bulbs will be brighter or dimmer; buzzers will be louder or quieter). Placing an additional component in the circuit will reduce the output of each device (e.g. if a second bulb is added, both bulbs will be dimmer than the first alone). Voltage (V) is a measure of the potential difference (electrical pressure) between the two terminals of a battery, measured in volts. Electrical current (I) is a measure of the flow of electricity through a circuit, measured in amps (A). The resistance to the flow of electricity in a conductor depends on the thickness, length, material and temperature of the conductor. Electrical resistance is measured in ohms.

Differentiated Activities

★ (working below)

Children are given a variety of circuits to make and draw. They calculate the voltage in each circuit and then observe the brightness of the bulb. All the equipment they need to construct the circuits is listed.

★★ (working at)

Children are given a variety of circuits to make and draw. They calculate the voltage in each circuit and then observe the brightness of the bulb.

Challenge Activity

Children are presented with a circuit and asked to give two ways in which they could change the brightness of the bulb.

Next Step Activity

Children are asked to predict what would happen to the volume of a buzzer if the voltage in a circuit is increased or decreased.

Assessment Questions

What is voltage?
How could we increase the voltage in a circuit?
Do all batteries have the same voltage?
Can you explain the relationship between the brightness of a bulb and the voltage in a circuit?
What would happen if you had too high a voltage in a circuit?

Self Assessment

I can associate the brightness of a lamp with the number and voltage of cells used in the circuit.

I can explain what happens if you add too much voltage to a circuit.

Key Vocabulary

- flow of electricity
- complete/incomplete
- voltage
- volts
- current