Progression of skills science - Electricity

Threshold Concepts This concept involves understanding circuits and their role in electrical applications.	Year 2	Year 4	Year 6
KS1 • *Identify common appliances that run on electricity.* • *Construct a simple series electrical circuit.* *LKS2* • Identify common appliances that run on electricity. • Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers. • Identify whether or not a lamp will light in a simple series circuit, based on whether or not the lamp is part of a complete loop with a battery. • Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit. • Recognise some common conductors and insulators, and associate metals with being good conductors.	• Electricity is a form of energy, used for lighting, heating, making sound and making machines and appliances work. • Pylons and cables carry electricity through the countryside, some electricity cables in busy cities are buried underground • Appliances are devices that run on electricity and they should be used safely (includes, no frayed wires, avoid spillages and keep away from water, not putting objects into sockets • Compare life in a village that has no electricity • A circuit is a complete path around which electricity can flow • Circuits contain components like wires, switches and bulbs.	• Electricity is a form of energy, used for lighting, heating, making sound and making machines and appliances work. • Some appliances run on electricity; some plug into the mains electricity and others run on batteries. • An electrical circuit consists of a cell or battery connected to a component using wires. • A series circuit is where all the components of the circuits are joined in one loop. If one part of the loop is incomplete, then the circuit will not work • Names of components include cells, wires, bulbs/ lamps, switches and buzzers • A cell is a single unit, and a battery is a collection of cells • One way to test to see if a circuit is complete is to use a bulb/lamp, if the lamp turns on then the circuit is complete.	• Recognise circuit symbols in a simple circuit- identify the simple circuit used in a hand torch • Electric current is measured in amperes, current is a flow of charge • Associate the brightness of a lamp or volume of a buzzer with the potential difference in a circuit • Investigate the brightness of a bulb if the PD is increased or the number of bulbs increased in a series circuit • Investigate how the length of wire affects the brightness of a bulb. • Potential difference is measured in volts • Resistance, measured in ohms, as the ratio of potential difference (p.d.) to current • Differences in resistance between conducting and insulating components (quantitative)

UKS2 • Associate the brightness of a lamp or the volume of a buzzer with the number and voltage of cells used in the circuit. • Compare and give reasons for variations in how components function, including the brightness of bulbs, the loudness of buzzers and the on/off position of switches. • Use recognised symbols when representing a simple circuit in a diagram.		• Switches open and close circuits. When a switch is open the bulb/lamp will not light up as the series circuit is incomplete. • Wires are made from metals as they are good conductors of electricity e.g., iron, copper and steel • Insulators are materials that do not allow electricity to pass through them easily e.g., plastic, wood, rubber and glass. • Thomas Edison invented the first practical incandescent light bulb	• Separation of positive or negative charges when objects are rubbed together: transfer of electrons, forces between charged objects • The idea of electric field, forces acting across the space between objects not in contact

Progression of skills to KS3 are detailed on electricity/ trust science sheets

Links from Reception Development Matters are detailed on the Reception Termly Planning Document