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Science: Electricity LKS2 year A

Definition: Electricity a form of energy resulting from the existence of charged particles (such as electrons or protons), either statically as an accumulation of charge or dynamically as a current

Physics definition: Physics is the study of nature and how matter and energy behave

POS:

- 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.

Prior learning
EYFS:
Children explore how things work.

Disciplinary concepts:
Structure – how is your circuit arranged?
Function – what is the purpose of the switch? Why are the wires coated in plastic?

Links to other science topics:

materials and their properties (conductors)

Common misconceptions:

- electricity flows to bulbs, not through them
- electricity flows out of both ends of a battery
- electricity works by simply coming out of one end of a battery into the components
- different coloured wires effect how the circuit works
- wires are made from plastic
- electricity is an object that can be seen
- current, voltage and electricity are all the same thing
- current gets less as it passes through components
- if a circuit is broken energy goes off into the air
- electricity comes out of both ends of the battery and leads to both sides of the component

Core Knowledge:

- household devices and appliances run on electricity. Some plug in to the mains and others run on batteries.
- an electrical circuit consists of a cell or battery connected to a component using wires.
- if there is a break in the circuit, a loose connection or a short circuit, the component will not work.
- a switch can be added to the circuit to turn the component on and off.
- metals are good conductors so they can be used as wires in a circuit.
- non-metallic solids are insulators except for graphite (pencil lead).
- water, if not completely pure, also conducts electricity.

Wider Knowledge:

- railway safety https://www.networkrail.co.uk/communities/safety-in-the-community/safe
- dangers of lightening http://www.weatherwizkids.com/?page_id=70#:~:text=What%20causes%20lightning%3F,collisions%20create%20an%20electric%20charge.

Working scientifically:

- identifying everyday objects according to the given property
- asking simple questions and recognise that they can be answered in different ways
- observing closely using simple equipment
- perform simple tests
- using their observations and ideas to suggest answers to questions
- gathering and recording data to help in answering questions

End Goals:

- to name the components in a circuit
- to make an electric circuit
- to control a circuit using a switch
- to give an example of a good conductor (metal - aluminium, copper, gold, water) and good insulators (rubber, plastics, wood , paper)

CPD: Reach out CPD - energy
Science Association / STEM website