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| **F:\Learning bugs\Foundation Subjects\Dolly the Fly - Science.jpgLyng Primary School Knowledge Organiser**  |
| **Topic:**  | **Science** **Electricity and circuits** | Year 4 | Autumn 2 |

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**Notable scientists**

**Benjamin Franklin**
(discovered that lightening is electrical. Most credit for discovering electricity is given to him)

**Thomas Edison**
(invented the first electric lightbulb.)

**What should I already know?**

* Children have not been introduced to Electricity yet within Science.
* Electricity is a form of energy that can be carried by wires and is used for heating and lighting, and to provide power for devices.
* Sources of light and sound may need electricity to work.
* That some devices within their homes and schools will use electricity.
* That a switch turns electric on and off (such as a light or mains plug)
* That some torches or toys may use batteries.

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| **What Step On and Goldilocks words will I use?** |
| **Spelling** | **Definition** |
| Appliances |  a **device** or machine in your home that you use to do a job such as cleaning or cooking. **Appliances** are often **electrical.** |
| Battery/ Cell | small **devices** that provide the **power** for **electrical** items such as torches |
| Bulb | the glass part of an **electric** lamp, which gives out light when electricity passes through it |
| Circuit | a complete route which an **electric current** can **flow** around |
| Conductor | a **substance** that **heat** or **electricity** can pass through or along |
| Current | a **flow** of **electricity** through a **wire** or **circuit** |
| Electricity | a form of **energy t**hat can be carried by **wires** and in used for **heating** and **lighting**, and to provide **power** for **devices** |
| Energy | the **power** from sources such as **electricity** that makes machines work or provides **heat** |
| Fuel | a **substance** such as **coal, oil,** or **petrol** that is burned to provide **heat** or **power** |
| Insulator | a **non-conductor** of **electricity** or **heat** |
| Mains | where the **supply** of **water, electricity,** or **gas** enters a building |
| Motor | a **device** that uses **electricity** or **fuel** to produce **movement** |
| Power | **Power** is **energy**, especially **electricity,** that is obtained in large quantities from a **fuel source** and used to operate **lights, heating**, and **machinery** |
| Switch | a small **control** for an **electrical device** which you use to turn the **device** on or of |
| Wires | a long thin piece of metal that is used to fasten things or to carry **electric current** |

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| **Investigate!** |
| * Explore different **electrical appliances** and decide whether they are **mains** or **battery operated.**
* Investigate the **electrical current** in a **circuit**
* Construct a simple **electrical circuit with a switch**
* Investigate how to make a **complete** and **incomplete circuit**
* Investigate to find out which materials are either **electrical conductors** or  **insulators**
* Build a **switch** that works effectively in an **electrical circuit**
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| **Enquiry Questions** |
| * How are electrical appliances powered?
* How do I construct an electric circuit?
* How do switches in a circuit work?
* How do materials act as conductors or insulators?
* What affects bulb brightness?
* How can we be safe around electricity?
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**What will I know by the end of the unit?**

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| Where does electricity come from? | * Electricity is generated using energy from natural sources such as the Sun, oil, water and wind
* These can also be called fuel sources
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| Which appliances run on electricity? | * Some appliances use batteries and some use mains electricity.
* Batteries come in different sizes depending on how much and for how long the appliance is used.
* Common appliances that use electricity.
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| How does a circuit work? | * A complete circuit is a loop that allows electrical current to flow through wires.
* A circuit contains a battery (cell), wires and an appliance that requires electricity to work (such as a bulb or motor).
* The electrical current flows through the wires from the battery (cell) to the bulb and motor.
* A switch can break or reconnect a circuit.
* A switch controls the flow of the electrical current around the circuit. When the switch is off, the current cannot flow. This is not the same as an incomplete circuit.
 |
| What are electrical conductors and insulators? | * When objects are placed in the circuits, they may or may not allow electricity to pass through.
* Objects that are made from materials that allow electricity to pass through a create a complete circuit are called electrical conductors.
* Objects that are made from materials that do not allow electricity to pass through and do not complete a circuit are called electrical insulators.
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| 1. Name these components in circuit. |
|   \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ | **S** |
|   \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ \_\_\_\_\_\_\_\_\_\_ | **E** |

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| 4. Will the bulb in these circuits be lit or not lit? |
| **S**  | **E** |

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| 2. Name three things are electrical appliances which are powered by: | **S** | **E** |
| Mains operated | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Battery operated | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |



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| 3. Which combination would make a simple complete circuit? | **S** | **E** |
| a) a buzzer, a battery and a bulb |  |  |
| b) a battery, a wire and a bulb |  |  |
| c) a bulb, a switch and a wire |  |  |