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**Knowledge Rich Curriculum Plan**

SCIENCE- Simple Electrical Circuits



| **Lesson/Learning Sequence** | **Intended Knowledge:**  *Students will know that…* | **Prior Knowledge:**  *In order to know this, students need to already know that…* | **Working Scientifically** | **Tiered Vocabulary and Reading Activity** | **Assessment** | **Support** |
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| ***Components within a circuit*** | *Students will know the symbols for a bulb, a cell, a battery, an ammeter, a voltmeter, a resistor and a switch.*  *Students will know that wires are represented using straight lines.*  *Students will know that a complete circuit is a circuit without any gaps.*  *Students will know how to draw simple circuits.* | *Students need to already know that symbols can be used to represent different components.* |  | *Component – any part of an electric circuit* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **Why might we use symbols to represent different components?**  **How could you break an electrical circuit?**  **Why would that break it?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty*](https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty) |
| ***Series Circuits*** | *Students will know that in a series circuit components are connected in a continuous loop.*  *Students will know how to draw a series circuit*  *Students will know how to construct series circuits from circuit diagrams.*  *Students will know how to make accurate observations about series circuits.* | *Students need to already know the symbols that are used to represent a bulb, a cell, a battery, an ammeter, a voltmeter and a resistor.* | *Making accurate observations on circuits* | *Series circuit – A circuit with only one continuous loop.* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **Why might two bulbs be dimmer than one?**  **Why might all of the bulbs on Christmas tree lights go out when one breaks?**  **What might happen to the bulbs if we added another battery?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/clips/zpj34wx*](https://www.bbc.co.uk/bitesize/clips/zpj34wx) |
| ***Current*** | *Students will know that current is a measure of how much electric charge flows through a circuit.*  *Students will know that current is measured in Amperes (A).*  *Students will know that an ammeter is used to measure the current within a circuit.*  *Students will know that an ammeter is connected in series with the components it is measuring.*  *Students will know that within a series circuit current is constant.* | *Students need to already know how to interpret circuit diagrams.*  *Students need to already know how to draw circuit diagrams.*  *Students need to already know that electrons* | *Using circuits to compare current at different points within the circuit.* | *Current – a measure of how much electric charge flows through a circuit.*  *Ammeter – component used to measure current.* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **What is flowing in an electrical circuit?**  **What happens to the current as it passes through a bulb?**  **How might you connect an ammeter to measure the current through a component?**  **How might the placement of the Ammeter affect the measurement of current?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty*](https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty) |
| ***Affects of Components on a Current*** | *Students will know that different components will affect the amount of current being measured within a circuit.*  *Students will know that by adding more components in a circuit you decrease the current flowing through the circuit.*  *Students will know how to develop a hypothesis for an investigation*  *Students will know how to evaluate results from an investigation* | *Students need to already know how to interpret circuit diagrams*  *Students will already know that current is not used up as it goes through components.*  *Students need to already know that an ammeter is used to measure current.*  *Students need to already know that an ammeter should be connected in series within a circuit.* | *Investigating the affect of components on current. Students will develop a hypothesis when investigating, and evaluate their results.* | *Hypothesis – a proposed explanation made on the basis of limited evidence as a starting point for further investigation*  *Resistance* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **What might happen to the current if we add another battery?**  **What might happen to the current if we add another bulb?**  **How might we test this hypothesis?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty n/6*](https://www.bbc.co.uk/bitesize/guides/zsfgr82/revision/6) |
| ***Voltage*** | *Students will know the effect of different battery voltages on simple circuits to be a greater amount of energy to the component. For example; a larger voltage battery will mean a brighter bulb up until the maximum brightness is reached. Voltage is the strength with which a battery can ‘push’ current around a circuit. The greater the voltage the greater the ‘push’ around a circuit. Students will know how to hypothesise the effect of different series combinations of 1.5V batteries on simple circuits. Students will be able to calculate the total voltage of combinations of different batteries in series.* | *Students will know the difference between a series and parallel circuit. Students will know the affects of components on a circuit and that the circuit needs to be complete for the current to move around the circuit. Students will know the unit of current is amps.* | *Investigating the affects of battery voltages on the amount of energy* | *Voltage*  *Energy*  *Voltmeter*  *Circuit*  *Volt*  *Component* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **How might adding more batteries affect the circuit?**  **Does it matter where you place the batteries in a circuit?**  **What might be the effect of swapping the terminals of a battery?**  **How might the bulbs change if more energy is added?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty*](https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty) |

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| ***Electrostatic Force*** | *Students will know that if an atom gains an electron it becomes negatively charged.*  *Students will know that if an atom loses an electron it becomes positively charged.*  *Students will know that electrons can move from one substance to another when objects are rubbed together.*  *Students will know that insulators can become charged through the transfer of electrons.*  *Students will know that if an object loses electrons when it’s been rubbed it will gain a positive charge.*  *Students will know that if an object gains electrons when it’s been rubbed it will gain a negative charge.*  *Students will know that oppositely charged objects will attract.*  *Students will know that charged objects with the same charge will repel.*  *Students will know that you can test an object is charged by seeing whether it would attract or repel another charged object.* | *Students need to already know that electrons are negatively charged subatomic particles.*  *Students need to already know that an insulator is a substance that doesn’t conduct electricity.*  *Students will know that friction is a force that occurs between two surfaces.* | *Charging an insulator* | *Insulator – an object that doesn’t readily conduct electricity or heat*  *Repel – force away* | *Retrieval questions*  *Simple exam questions*  *Homework quiz 1*  *End of topic test*  *Summative assessment 3*  **How might you get an electric shock?**  **How might you test if an object is charged or not?** | *Knowledge organiser (provided on Teams and in class)*  [*https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty*](https://www.bbc.co.uk/bitesize/topics/zgy39j6/articles/zjm8kty) |