SUBJECT: Physics YEAR: 10 MTP TITLE: Electrical devices and applications HALF TERM: 5 NO. OF LESSONS (approx) 8

Deliberate and specific retrieval of expected prior knowledge

- Basic Circuit Components: Knowledge of basic electrical components such as cells, batteries, switches, wires, resistors, and bulbs.
- Electric Current: An understanding that current is the flow of charge, and it flows from the positive to the negative terminal in a circuit.
- Simple Series and Parallel Circuits: Basic understanding of how to connect components in series and parallel, and the effects on current and voltage.
- Conductors and Insulators: Recognizing that materials like metals conduct electricity and that non-metals tend to insulate.

Academic transformation

- Electric Current: Understanding that electric current is the rate of flow of charge, measured in amperes (A), and the relationship between current, charge, and time.
- Voltage and Resistance: The role of voltage (potential difference) in driving current through a circuit and the concept of resistance that opposes current flow. Ohm's Law (V = IR) is introduced.
- Resistance and Temperature: Exploring how resistance changes with temperature in different materials (e.g., conductors vs. insulators).Components: Understanding the role of resistors, light bulbs, diodes, and thermistors in circuits.
- Direct and alternating potential difference: Recall the mains electricity is an AC supply, frequency 50Hz and is about 23V.
- Mains electricity: Know the colour covering for each of the wire colour, live wire- brown, neutral wire – blue, earth wre – green and yellow. Understand the safety aspects of the plug
- National grid: Students should be able to describe the main features of the national grid. They need to then explain the use of step up and down transfers as an efficient way to transfer energy

Personal transformation

Electrical Safety: Practical knowledge of safety in electricity, from household wiring to industrial applications, and the role of circuit breakers, fuses, and grounding.

Can I Learning Questions

Can I recall what happens with current, p.d and resistance in parallel and series?
Can I describe the difference between alternating a direct current?
Can I describe how to wire a plug?
Can I explain the importance of the national grid?
Can I describe the different forms of renewable energy?
Can I recall ohms law and apply it?

Literacy and Oracy

Literacy Tasks:

Report Writing: Students write a report on an investigation of current and resistance in a series circuit. Include data analysis and conclusions.

Key Terminology: Reinforce important terms like voltage, current, resistance, Ohm's Law, power, and energy. Students can define and use them in context.

Case Study: A written case study of how electricity is used in everyday devices (e.g., how a microwave uses electricity to produce heat).

Oracy Tasks:

Group Discussion: Students discuss the pros and cons of different methods of generating electricity, including fossil fuels and renewable sources.

Debate: "Is the future of energy in electricity?" Students debate whether we should invest more in electrical power generation versus other energy forms.

Peer Teaching: Students explain Ohm's Law to each other in pairs, using simple analogies to describe how current and resistance are related.

Misconceptions

Voltage and Current are the same: Many students confuse voltage (potential difference) with current, not realizing that voltage is the driving force that causes current to flow.

Higher resistance means less current in series circuits, but no effect in parallel: Students may mistakenly believe resistance has no effect on the current in parallel circuits. In reality, total resistance decreases as more branches are added to a parallel circuit.

All resistors behave the same way: Students may not understand that different materials or resistors behave differently under various conditions, such as the temperature dependence of resistance.

The battery supplies current: A common misconception is that a battery "sends" current, when in reality, it creates the potential difference that drives the flow of charge through the circuit.

Current flows from negative to positive: Students often misunderstand that current flows from the