# Electrical Principles and Technologies

## Unit D

### Topic 1: Electric Charges
- Producing Charges
- Making Sense of Electrical Charges
- Conductors, Insulators, and In-Between
- Neutralizing Unbalanced Charges
- Preventing Electrostatic Buildup

### Topic 2: Electricity Within a Circuit
- Circuit Elements and Diagrams
- Basic Circuit Symbols
- Measuring Current
- Measuring Voltage
- Rivers of Electricity

### Topic 3: Resisting the Movement of Charge
- Calculating Resistance
- Model problem
- Resistors
- Variable Resistors
- Types of Circuits
- House Wiring

### Topic 4: The Energy Connection
- Electricity and Heat
- Electricity to Motion
- Motion to Electricity
- Electricity to Light
- Light to Electricity

### Topic 5: Portable Power
- Electrochemical Cells
- Fuel Cells
- Types of ‘dry’ cells

### Topic 6: Generators and Motors
- Electricity to Magnetism
- Electromagnets
- Magnetism to Electricity
- What’s in a Generator?
- DC Generators
- Electric Motors: Electric to Mechanical Energy
- DC Motors
- AC Motors

### Topic 7: Electricity in the Home
- Transmission of Electricity through the Power Grid
- From the Grid into Your Home
- Home Wiring
- Digital Devices
- Measuring Electric Power
- Model Problem
- Paying For Electric Energy
- Model Problem
- Power Rating
- Electric Devices and Efficiency
- Incandescent Bulbs
- Halogen Bulbs
- Fluorescent Tubes
- Model Problem
- Home Electric Safety
- Electric Safety Outdoors

### Topic 8: Electricity Production and the Environment
- Electric Energy from Burning Fuels
- Fossil Fuels Affect Land and Air
- Electric Energy from Flowing Rivers
- Energy from Atomic Reactions
- Heating the Environment
- Electrical Technology and Society
- Cogeneration
- Reducing the Energy Wasted by Devices
- Alternative Energy Sources
- Electrical Energy Sources and Alternatives