

# Required Knowledge: Electronic Products

- Calculate Voltage, Resistance and Current using Ohms Law   
( $V = I \times R$ )
- Resistor colour code + Calculating Resistor values. (Series and Parallel)
- Capacitors: Characteristics and Uses (Charging and Discharging graphs)
- Time Constant Calculations for Resistor/Capacitor networks (RC Networks) using:   
 $T = C \times R$
- Use of Multimeters (Measuring Voltage and Current)
- Transistors: Function, Uses, Gain Calculations using:   
 $H_{fe} = I_c / I_b$
- Potential Dividers: Uses and calculations using:   
Voltage out =  $\frac{R_2 \times \text{Supply Voltage}}{R_1 + R_2}$
- Diodes: Uses (Back E.M.F.)
- Operational Amplifiers (Comparators)
- Power Supplies
- Switches (Types and Legs)
- Resistors, Types, Values & Uses
- Prototyping: Breadboard & VeroBoard
- Thyristors and FETs
- Integrated Circuits: Timers (555)   
Counters  
Logic
- Microcontrollers (What they are and how to program them)
- Transducers: LDR   
PhotoDiode  
Thermistor  
Microphone
- Systems: Input > Process > Output (& Feedback)
- Plastics: Vacuum Forming HIPS, Laser Cutting Acrylic, Injection Moulding ABS
- Smart Materials: EL materials, shape memory metals, fibre-optics, PV cells, piezoelectric cable, QTC
- Scales of Production: one-off, Batch, Mass/"High Volume" (in particular for PCBs)