

WHAT ARE THE BIG AIMS OF YEAR 7 Electronics?

To de-mystify electronics. Complex concepts will be de-constructed into chunks that can be assimilated by pupils based on their existing understanding of the world. Identify and address misconceptions by getting pupils to build and analyse relatively simple circuits. They will develop drilling and soldering skills. Pupils will program microcontrollers to simulate how these are used in microwaves, cars, alarms etc.

WHAT WILL EXCELLENCE LOOK LIKE IN YEAR 7?

Pupils identify insulators and conductors using test procedures.
They can identify energy converters with everyday examples.
Pupils understand there are different ways of storing energy.
They understand the concepts of voltage, resistance, current and current flow.
Pupils can build systems using a sensing/processing/output model.
They are able to program a microcontroller and successfully manufacture a completed USB circuit.

WHAT KNOWLEDGE DO THE PUPILS NEED TO ACQUIRE?

- Electrical insulators and conductors
- What voltage, current and resistance are and their relationship
- Names, symbols and uses of a range of components
- Some components are polarised some not
- There are two ways of controlling the amount of current
- What is the most appropriate method for a given task

WHAT SKILLS DO THE PUPILS NEED TO DEVELOP?

- How to assemble circuits using computer simulation
- How to assemble circuits on a prototype board
- How to use a PCB drill accurately and safely
- How to solder components – build/test approach
- A systematic approach to fault finding on a PCB

WHAT MISCONCEPTIONS MAY THEY HAVE FROM PREVIOUS LEARNING?

All components are polarised. Because a light is on it is working, because it is off, it's not working. Electrical insulation and heat insulation are the same thing.

WHAT ASSESSMENTS WILL BE USED ACROSS THE YEAR TO DEMONSTRATE HOW THE PUPILS HAVE ACQUIRED THE KNOWLEDGE AND DEVELOPED THE SKILLS?

Pupils will draw five progressively more complex circuit diagrams. Pupils are allowed to work collaboratively during the soldering of the USB project, on completion they will solder two resistors independently. Prototype board construction requires knowledge and skill, several prototyping challenges will be set each with varying levels of support, ranging from a circuit diagram to verbal description, PowerPoint presentation to a video clip. Programming is a knowledge based activity, pupils will be asked to write microcontroller flowcharts that respond to inputs and control outputs to solve three increasingly complex tasks.