

Topic	Rationale	Knowledge acquisition	Tasks - Notes	Key vocabulary	Skills and enrichment
Electronic Systems	This Year 9 Design and Technology project is designed to introduce students to the fundamental concepts of systems and control, with a focus on the integration of various technologies used in automation. The project will cover key topics such as system block diagrams, microcontrollers, flowcharts, automation principles, and software circuit simulation. By the end of the project, students will gain hands-on experience in developing a control system that incorporates both hardware and software components, enabling them to understand how automation systems function in real-world applications.	<p>Lesson 1 (double) System Block Diagrams</p> <p>To know how to identify an electronic system as an Input, Process, Output concept.</p>	<p>Starter list electronic functions of washing machine</p> <p>Know difference between input, process and outputs and where systems can be found</p> <p>Understand basic components and where they are used</p>	<p>Input Process Output</p>	<p>Subject Specific Skills:</p> <ul style="list-style-type: none"> • Analysis • Evaluating • Modelling development - virtual • Programming • CAD <p>Numeracy</p> <ul style="list-style-type: none"> • Resistor values <p>Literacy</p> <ul style="list-style-type: none"> • Key vocab, meanings and context • Comprehension of instructions for processes <p>Cultural Capital</p> <ul style="list-style-type: none"> • Programming in the real world. <ol style="list-style-type: none"> 1. Understanding System Design: Students will learn how to represent a control system using system block diagrams, identifying inputs, processes, and outputs. This visual approach helps students organize and communicate complex information effectively. 2. Microcontroller Programming: Students will be introduced to microcontrollers and their role in controlling systems. They will learn how microcontrollers can be programmed to automate tasks and interact with sensors and actuators. 3. Flowcharting: Flowcharts are an essential tool in systems design and programming. By learning how to create flowcharts, students will improve their problem-solving and decision-making skills. Flowcharts will also aid in the process of writing simple code for the microcontroller. 4. Automation Principles: Students will explore automation and its applications in the real world. They will learn how automation reduces the need for human intervention and can increase efficiency in systems such as manufacturing lines, smart homes, and traffic management systems. 5. Software Simulation: Students will use software circuit simulation tools to design, test, and modify their
		<p>Lesson 2 (double) Micro-controllers</p> <p>To know how to break down a circuit into a system with flow charts.</p>	<p>Homework 1</p> <p>Starter name the components</p> <p>Understand how PIC microcontrollers work</p> <p>Counting, timing, comparing</p> <p>Flow charts for control</p> <p>Writing programs using circuit wizard</p>	<p>System Control Flowchart</p>	
		<p>Lesson 3 (double) Automation</p> <p>To know what automation in industry is and how it impacts on our lives regarding Social, Moral and Economic factors.</p>	<p>Homework misconceptions</p> <p>Starter understand flowchart symbols</p> <p>Automation in factories</p> <p>Social and economic factors of automation</p> <p>Application of Knowledge through exam questions.</p> <p>Assessment and feedback on product analysis. Live marking opportunity</p>	<p>Social Moral Economic</p>	

			<p>systems before physical implementation. This hands-on approach to circuit design will help students identify potential problems in their design and make improvements prior to creating physical models.</p> <p>6. Problem-Solving and Critical Thinking: Throughout the project, students will be challenged to identify problems, come up with solutions, and test those solutions in a structured way. These activities will enhance their ability to think critically and work methodically.</p> <p>Links to National Curriculum:</p> <p>Design:</p> <ul style="list-style-type: none">• identify and solve their own design problems and understand how to reformulate problems given to them• use a variety of approaches to generate creative ideas and avoid stereotypical responses• develop and communicate design ideas using annotated sketches, detailed plans, 3-D and mathematical modelling, oral and digital presentations and computer-based tools• investigate new and emerging technologies• understand developments in design and technology, its impact on individuals, society and the environment, and the responsibilities of designers, engineers and technologists <p>Technical knowledge:</p> <ul style="list-style-type: none">• understand how more advanced electrical and electronic systems can be powered and used in their products [for example, circuits with heat, light, sound and movement as inputs and outputs]• apply computing and use electronics to embed intelligence in products that respond to inputs [for example, sensors], and control outputs [for example, actuators], using programmable components [for example, microcontrollers]
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