STEM Curriculum - Year 9

Pupils are introduced to the STEM curriculum in year 9 they study the ICDL Digital Robotics course.

Pupils will be able to:

- Understand key concepts relating to robots and robotics systems, and identify examples of robots
- Identify the main parts of a robot and their function, including microcontrollers, actuators, sensors, and power sources
- Understand the elements of a simple control system, and test a control system • Understand basic programming concepts, and create and execute a programme in a visual programming language
- Set up a robot, implement robotic motion, and control a robot in an environment

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9 **ICDL Robotics**	**Complete robot revolution** **before starting BCS:** 📄 EducatorGuide_RobotRev…		**2 Robotics Parts** **2.1 Basic Parts and** **Components** 2.1.1 Identify the basic parts of a robot like: actuator,		**Dyson Engineering kit** **3 Simple Control** **System** **3.1 Control System**	

		microcontroller, sensor, power source.
1 Robotic Concepts	2.1.2 Identify components in a robot kit like: chassis,	**Overview**
		3.1.1 Identify the elements of a control system.
1.1 Robots and	electronics parts, cables, tools and parts for	
Automated Systems		Understand the basic types of control: open loop,
	assembly.	
1.1.1 Define robots, robotics systems.		closed loop.
1.1.2 Understand that robots can be teleoperated,		3.1.2 Recognise connections to a microcontroller like:
semi-autonomous, autonomous.	**2.2 Microcontroller**	button, power, motor, USB input, wireless
	2.2.1 Recognise that the microcontroller collects	
1.1.3 Understand that robots can be fixed or mobile.	information from input devices like sensors,	technology, sensors, output devices.
		3.1.3 Identify connections to the microcontroller
1.2 The Use of Robots	executes a program, controls output devices like	
1.2.1 Identify common uses of robots in different		represented in a block diagram.
	LED lights, sound device.	
environments like: home, school, manufacturing,	2.2.2 Identify common microcontroller ports like:	3.1.4 Set up a simple control system using elements
healthcare.		like: power, motor, sensors.
	power, USB, wireless, input, output.	
1.2.2 Identify advanced uses of robots like: driverless		
		3.2 Test a Simple
cars, robot-assisted surgery.		**Control System**
1.2.3 Identify ethical issues in the use of		

	robots like: *harming humans.*	**2.3 Actuator System** 2.3.1 Identify main parts of the actuator system like: switch, motor. 2.3.2 Understand that the actuator transforms electrical power into mechanical power, enabling the robot to function. **2.4 Sensor** 2.4.1 Understand that a sensor detects changes in its environment like: light intensity, distance, angle. 2.4.2 Recognise the function of different types of sensors like: light, sound, gyroscope. **2.5 Locomotion, Power** 2.5.1 Identify the parts of a robot that support motion	3.2.1 Run pre-defined programs to provide output values like: light intensity, sound, distance, angle. 3.2.2 Recognise that there is a response time between inputs and outputs. 3.2.3 Recognise that changing variables in a program affects outputs.

		like: arm, wheels. 2.5.2 Identify power sources like: batteries, solar power	