i2Tech

Curriculum

	Level 01 (K1 & K2 _7-10 yrs)	Level 02 (K3 & K4 _11-14 yrs)
Programming Language	Scratch (Magiccode) - block-based programming	Magicblocks (IoT) + Scratch (Robotics)
Hardware Kit	Magicbit TINY - Robotics Learning kit	Magicbit learner Kit + classic 2W robotics kit
Magicbit Device	Magicbit Tiny	Magicbit Core
Lessons	01.1 - Introduction to Scratch (Magiccode) 01.2 - Light show	01 - Intro to IoT + Magicbit OS
	02 - Dimmer Magic	02 - Magicblocks set up + LED Blinking
	03 - Secret message	03.1 - Simple Traffic Light System 03.2 - Knight Rider pattern
	04.1 - Day - Night Predictor 04.2 - Night Light	04 - Light level meter
	05.1 - Anti-theft 05.2 - People count	05.1 - Smart light 05.2 - Smart street light
	06.1 - Moving sprites 06.2 - Apple collector - Animated Game	06.1 - Smart Reader 06.2 - Talking Tom
	07 - Introduction to Robotics	07.1 - Digital Clock 07.2 - Stopwatch
	08 - Bluetooth remote control car	08 - IoT weather station

09 - Obstacle-avoiding robot car	09 - Multiple IoT devices (via MQTT)
10 - Roach Robot	10 - Exam grading system
11 - Dancing Robot	11- Scratch basics
12 - Automatic rail gate	12 - Magicbit as a joystick - animated games
13 - Robot Battle	13 - Intro to Robotics + Robot Assembly
14 - Automatic Water Tap	14.1 - Obstacle avoiding bot 14.2 - WiFi Bot
15 - Automatic Plant watering system	15 - Robot battle

Detailed Plan for Level 01

Lesson Name	Learning Outcomes	Delivery Method	Aligning with National Curriculum
01.1 - Introduction to Scratch (Magiccode)	● Introduction Scratch / Magiccode Platform ● Basics of the block-based programming (Scratch)	● Introduce Magiccode interface ● Introduce the Magicbit Tiny Device	**KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
01.2 - Light show	● LED controlling with digital signals	● A simple activity to blink the on-board LEDs in the magicbit tiny	**KS1:** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
02 - Dimmer Magic	● About the potentiometer - electronic component ● Practical applications of basic electronic circuits ● Creativity and Innovation	● Create a simple table lamp structure and make the program to control it using MagicCode and Magicbit Tiny	**KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

03 - Secret message	● Practical applications of basic electronic circuits ● Creativity and Innovation ● Functioning of the Buzzer	● Displaying a password/morse code using LEDs and a buzzer	**KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
04.1 - Day - Night Predictor 04.2 - Night Light	● Creativity and Innovation ● Functioning of the LDR ● Animations in Scratch	● A scratch animation to indicate day and night according to the environmental light condition ● Activating a light bulb (LED / RGB) according to the environmental light condition	**KS1**: Recognise common uses of information technology beyond school. **KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
05.1 - Anti-theft 05.2 - People count	● Practical applications of the concepts ● Creativity and Innovation ● Functioning of the proximity IR sensors ● Variables in programming	● Activating an alarm from the buzzer when the IR sensors detect a movement ● Counting the no.of people (motions) entering through a door and going out from the door when the Proximity IR sensors detect a motion.	**KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
06.1 - Moving sprites 06.2 - Apple collector - Animated Game	● Functioning of the push buttons ● Handling sprites in scratch with push buttons ● Multiple sprites, multiple scripts handing	● Control sprites with Magicbit Tiny push buttons ● Animating few sprites to make a simple game	**KS1:** Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
07 - Introduction to Robotics	● Understand robot components and how they work together	● Discussion with videos	**KS2:** Understand how digital systems work; Understand physical systems and sensors
08 - Bluetooth remote control car	● Bluetooth-Remote Controlling technique ● Robotics Basics	● Assembling a robot car and programming via scratch which can be controlled via Bluetooth	**KS2:** Design and debug programs to control physical systems; Use various forms of input/output

09 - Obstacle-avoiding robot car	● Obstacle avoiding technique ● Functions of Ultrasonic sensor ● Robotics Basics	● Programming the same robot car for obstacle-avoiding	**KS2**: Use selection in programs; Solve problems by decomposing them; Simulate/control physical systems
10 - Roach Robot	● Sensor readings with robotics concepts ● Create a responsive robot mimicking insect behaviour	● Controlling the robot according to the environmental light condition - Cockroach concept	**KS2**: Design creative programs that simulate real-world behaviours; Work with input/output and logical reasoning
11 - Dancing Robot	● Robotics concepts, ● Neo-pixel LED functions ● Buzzer functions	● Control the robot as it looks like dancing while generating different light patterns via Neopixel LED and some musical tones via the buzzer.	**KS2**: Use sequence and repetition in programs; Create programs with specific goals
12 - Automatic rail gate	● Practical applications of the concepts ● Creativity and Innovation ● Functioning of the proximity IR sensors ● Functioning of the servo motors	● Activate the servo motor as the rail gate when motion is detected by the Proximity IR sensors	**KS2:** Control physical systems using software; Use selection and input/output in programs
13 - Robot Battle	● Test the previously learned concepts in one application	● Arrange a robot battle which the students program the robots	**KS2:** Control physical systems using software; Use selection and input/output in programs
14 - Automatic Water Tap	● Practical application of the concepts ● Servo motor operation ● IR proximity sensor readings	● Use proximity sensors to control water flow automatically	**KS2:** Simulate/control physical systems; Combine hardware inputs and program logic
15 - Automatic Plant watering system	● Use of servo motor for precise control in automation projects ● Understand the importance of timing and delays in coordinating actions ● Explore the concept of automation in daily tasks	● Servo motor operation with timing	**KS2**: Design systems for automation; Present and evaluate results

Detailed Plan for Level 02

Lesson Name	Learning Outcomes	Delivery Method	Aligning with National Curriculum
01 - Intro to IoT + Magicbit OS	● Basics of IoT ● Familiar with Magicbit device	● Discussions ● Pre-loaded programs	**KS3** - Understand hardware/software components and how they communicate with one another and with other systems
02 - Magicblocks set up + LED Blinking	● Getting familiar with the magicblocks.io platform ● Digital signals handling via magicblockks	● Magicblokcs account Creation ● LED Blinking activity	**KS3** - Use programming languages to solve computational problems and understand how digital systems work
03.1 - Simple Traffic Light System 03.2 - Knight Rider pattern	● Digtal signals handling ● Practical Applications of Digital Signal Handling	● Controlling On-board LEDs on the Magicbit	**KS3 -** Design and use computational abstractions that model real-world systems and use logical reasoning to compare algorithms **KS3 -** Develop modular programs that use procedures or functions; use loops and control structures
04 - Light level meter	● Functions of LDR ● Analog inputs / readings	● Displaying readings	**KS3 -** Undertake creative projects involving data collection and analysis using digital systems
05.1 - Smart light 05.2 - Smart street light	● Practical applications of the concepts	● Simple activities to control lights according to the sensor readings	**KS3 -** Apply Boolean logic (e.g., IF conditions); develop problem-solving skills through programming **KS3 -** Model behavior of physical systems; develop solutions using digital input/output
06.1 - Smart Reader	● Text inputs handing ● Audio output handling ● Practical applications of the concepts	● Activity to read out the given texts	**KS3 -** Understand and manipulate data inputs (e.g., RFID); develop modular programs

06.2 - Talking Tom			**KS3 / KS4 -** Create digital artefacts combining hardware and software; use technology creatively and expressively
07.1 - Digital Clock 07.2 - Stopwatch	● Time handling ● Text displaying	● Activities with timing	**KS3 -** Develop modular programs; manipulate data types like time **KS3** - Create programs to solve real-world problems; apply algorithmic logic and use of variables
08 - IoT weather station	● Use an API service to receive data. ● IoT dashboards	● Displaying weather details received from an API on an IOT dashboard	**KS3 -** Collect, analyse and present data; integrate multiple digital systems and sensors
09 - Multiple IoT devices (via MQTT)	● Communication between multiple IoT devices ● MQTT basics	● Activity to communicate between multiple magicbits	**KS3 / KS4 -** Understand how systems communicate; develop networked systems; use new or unfamiliar technologies analytically
10 - Exam grading system	● Conditional statements ● Practical application of the concepts	● Activity to decide grades according to marks	**KS3 / KS4 -** Use appropriate data structures (arrays/tables); write programs to solve defined problems; evaluate information technology analytically
11- Scratch basics	● Introduction Scratch / Magiccode Platform ● Basics of the block-based programming (Scratch)	● Discussion and activities with Magicbit	*KS3 -* Block-based programming for problem-solving; apply fundamental concepts of computer science (sequences, logic)
12 - Magicbit as a joystick - animated games	● Scratch programming basics - Multiple sprites , multiple scripts ● Push buttons handling	● Animated game creation	**KS3 /KS4 -** Use technology creatively; design interactive content; develop logic and computational thinking

13 - Intro to Robotics + Robot Assembly	● Understand robot components and how they work together	● Discussion with videos	**KS3 /KS4 -** Model physical systems and how software interacts with hardware; develop design and abstraction skills
14.1 - Obstacle avoiding bot 14.2 - WiFi Bot	● Obstacle avoiding technique ● Controlling a robot via a web page	● Playing with the robot using pre-loaded programs + scratch codes	**KS3 /KS4 -** Apply key algorithms to physical tasks; evaluate and test autonomous systems **KS3 /KS4 -** Understand digital communication systems; use hardware and networking concepts; solve problems using technology
15 - Robot battle	● Test the previously learned concepts in one application	● Arrange a robot battle which the students program the robots	**KS3 /KS4 -** Engage in creative computing projects; develop problem-solving and optimization strategies; simulate