# Lesson 21 – Smart Robotics Project Electronics

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| The Big Picture – Why Is This Relevant? | Learning Objectives |
| * Understanding the basic electronic components and how these can be used with the micro:bit | * Understand the function of basic electronic components * Control motors and servos using a micro:bit * Control the output from a speaker using a micro:bit |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Lots of opportunities for Learners to be creative and apply their learning | **Expected Progress:**   * Learners are able to control an LED or Sound   **Good Progress:**   * Learners are able to control an LED and Sound   **Exceptional Progress:**   * Learners are able to produce unique melodies using the sound block |
| Key Concepts | Key Words |
| * Digital and analogue data | * Resistor * Capacitor * LED * Sensor * Motor * Servo |
| Links to KS3 Programme of Study | |
| * understand how instructions are stored and executed within a computer system | |
| Differentiation | Resources |
| Some Learners will struggle using blocks to write directly to the micro:bit rather than the Bit:Bot extension. Pair Learners and support with this difference | * Lesson 21 ppt * Lesson 21 Activity Sheet * PC * Internet Access * Access to <https://makecode.microbit.org> * Basic LEDs * Examples of resistors and capacitors * 3v motors and servos for use with micro:bits * Headphones or speakers |
| Lesson Flow | |
| * Introduce the Learning Objectives * Discuss the roles of resistors (to restrict or limit current) and capacitors (to store an electrical charge) within a circuit. If possible have examples to show * When discussing LEDs explain the difference between standard single colour LEDs and RGB Neopixel style LEDs * Use slide 5 to demonstrate and let Learners experiment with connecting an LED directly to a micro:bit and turning it on and off with a digital signal – show how you can control LEDs directly but utilising different pins (if you have red, green and yellow LEDs the Learners could line them up as traffic lights * Slide 6 Reintroduce sensors and analogue data – if possible use software like Audacity to record your voice and show the sound wave or use an oscilloscope to demonstrate a sound wave. * If motors are available show Slide 7 to review how the Bit:Bot blocks can be used to control motors and servos but then demonstrate and let Learners experiment how this can be done with motors an servos connected directly to the micro:bit * Demonstrate how to connect a speaker to the micro:bit and the power of the melody and sound blocks. Let Learners experiment * Introduce the Task Activity Sheet * Encourage Learners to attempt the Stretch Tasks * Encourage Learners’ creativity | |
| Making | |
| No making activities in this lesson. | |