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| **TITLE:** |  | | **DURATION:** |
| INTRODUCTION TO ARDUINO | | | 30 mins |
| **OBJECTIVES:** | | **RESOURCES REQUIRED** | |
| * Describe what an Arduino is * Discuss some examples of what type of devices can be controlled and used by an Arduino board. * Describe what the different types of 'Pins' are on an Arduino board and what they do * Describe how to program to an Arduino Board. | | * PowerPoint * Arduino for each group | |
| **SECTION** | **POINTS TO COVER** | | |
| **Introduction:** | * Objectives * Arduino being the ‘brain’ of the robot we will make * Ask if anyone has used Arduino before | | |
| **Main:** | * What is Arduino?   + Arduino is a programmable microprocessor (brain)   + It can take inputs from sensors and controllers   + It can provide outputs to control devices/components * Hand out Arduinos   + When discussing specific pins, get cadets to identify the pins on their Arduinos * Identify pins   + Power Pins (for providing power to devices)   + Analog Pins (for reading signals from input devices)   + Digital Pins (for sending output signals and reading some input signals) * Powering the Arduino   + The Arduino can be powered in 3 ways:     - USB – B Cable     - Barrel Jack Connector (9v battery)     - Vin Pin * Power Output Pins   + Explain that you can use 5v and 3.3v pins to power electrical devices.   + Higher voltages give higher power output (This will be demonstrated in a couple lessons) * Ground Pins (GND)   + If electricity flows out of the Power Output Pins, it flows into the Ground Pins   + Flowing electricity (charge) is what actually powers electrical devices   + Emphasize the idea of flow from Power (usually 5v to GND) * Digital Pins   + These pins can send or receiver digital signals   + This means ON or OFF   + TRUE or FALSE   + HIGH or LOW * Digital Devices   + Here are some Examples of digital devices * Pulse Width Modulation (PWM) Pins   + We can output signals between HIGH and LOW using PWM Pins   + These are those on an Arduino labelled by a ~   + PWM Pins work by quickly pulsing the pin ON and OFF * Analog Pins   + These pins can read input signals between 5v and 0v   + This is good for sensors which output a range of values     - Sound Sensors     - Temperature Sensors     - Etc. | | |
| **Conclusion:** | * How to Program Arduinos   + Now that we know what the pins do, how do we use them?   + We can program the Arduino to send specific signals out of the digital pins and read signals from the analog pins   + This is how we will control our robot! * Next, we will learn how to program our Arduinos | | |