# Lesson 1 – Introduction to the Arduino

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| The big picture – why is this relevant? | Learning objectives: |
| * Physical computing is going to play a large part in the future * Programming is an important skill; learners demonstrate much more creativity and engagement when working with physical devices | * Understand what an Arduino is * Understand what the IoT is * Understand the advantages and disadvantages of connecting IoT devices |
| Engagement – how can I engage learners? | BAssessment for learning |
| * Inspire learners by explaining some of the practical solutions that they will develop throughout the course * Learners are typically enthused by the use of electronics and physical computing hardware * Learners will be inspired to be able to see the actual hardware on the board and create their first program | **Expected progress:**   * Learners will understand the structure of the course and the different devices that they will be creating   **Good progress:**   * Learners will be able to identify the different elements on the Arduino board * Learners will understand how the board can be used to create a range of IoT devices   **Exceptional progress:**   * Learners will be able to identify the different elements on the Arduino board and be able to explain the purpose of each piece of hardware * Learners will understand how the board will be used to create a range of IoT devices and the purpose of a shield |
| Key concepts: | Key words: |
| * An Arduino is a microcontroller * A shield is used to add additional functionality to the core board * The IPO model takes in an input, processes it and then delivers an output * IoT relates to a whole range of connected devices | * IPO model * Microcontroller * IoT * Arduino * Shield * IDE * Breadboard |
| Differentiation: | Resources: |
| This is an introductory lesson to highlight the structure of the course and introduce students to the key pieces of hardware which they will be using. If any students complete the key introductory tasks, they can start to explore the different sample programs which are built into the IDE. | * Lesson 1 ppt * MKR Worksheet * IoT Ideation Worksheet * IoT Home Worksheet * MKR WAN 1300 |
| Lesson flow | |
| * Introduce students to the course. Highlight the project-based learning approach along with some of the exciting projects that they will be working on * Discuss the IPO model which will be used throughout the course. An input has a process applied to it to generate an output. * Show students the physical Arduino computer. Explain that the Arduino is a micro controller. Students should try to identify some of the input and output devices which are included in the Arduino. They should aim to label all of the key elements on the MKR worksheet. The worksheet gives learners a structure for this exercise. If any learners have experience using an Arduino, they can attempt the stretch task independently while other learners research what the different elements of the Arduino are. * Discuss the meaning of the term ‘embedded system’. All IoT devices have embedded systems to control them. Discuss what the IoT is and how it works. * Use the PowerPoint presentation to discuss how the IoT works. Students should then complete the IoT Ideation worksheet where they will come up with ideas for potential devices which could be developed to help within the classroom. (Slide 9) * Learners should then sketch a device which they may wish to develop to help them within their home. They should highlight the potential advantages and disadvantages of connecting it to the Internet. | |
| Making | |
| * There are no making activities in this introductory lesson | |