# Lesson 2 – The IPO Model

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| The Big Picture – Why is This Relevant? | Learning Objectives |
| * Learners need to start to think about how they can break down complex problems into smaller solvable tasks that together can solve a large problem | * Understand the Input Process Output model * Apply computational thinking to solve problems * Use algorithms to represent solutions to problems |
| Engagement – How Can I Engage Learners? | Assessment for Learning |
| * Encourage Learners to experiment * Get Learner to think of examples of systems they interact with * Get them to think about non-IT systems and identify IPO * When looking at commands Learners like to plan this in an active/drama way maybe moving around the classroom to fetch bottles etc | **Expected Progress:**   * Learners can identify how sensors can provide inputs   **Good Progress:**   * Learners are able to produce an IPO table   **Exceptional Progress:**   * Learners are able to complete some of the Stretch Tasks * Learners can start considering the ethical implications of robots in the workplace |
| Links to KS3 Programme of Study | |
| * understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems * understand how instructions are stored and executed within a computer system | |
| Key Concepts | Key words |
| * Input Process Output * Systems * Ethical/Moral Concerns | * Input Process Output * System * Algorithm * Abstraction * Decomposition |
| Differentiation | Resources |
| Use verbal scaffolding to support weaker Learners  Create a part completed IPO table with gaps rather than an empty table | * Lesson 3 ppt * Lesson 3 Activity Sheet * Paper * Pens * PC * <http://lightbot.com/flash.html> * Differentiated IPO table if required |
| Lesson Flow | |
| * Introduce the objectives, make sure Learners are happy with the term algorithm. If not explain this as a solution to a problem like the order you get dressed or how to make a cup of tea * Explain the concept of IPO ensure you clearly explain that this is not an IT system, that all systems follow this model – give examples of non-computer based systems or non-traditional systems * Define the CT terms Abstraction and Decomposition – explain how these can be used together in order to solve complex problems. Good examples of abstraction are London Underground Map or comparing a walking map to a satellite image * Discuss the scenario in the worksheet, link to big warehouses like Amazon or London Gateway that use automatic pickers * Talk about the different sensors available and link this to human senses * Get Learners to develop and test algorithms used to move robots from parking to the bin and the desk * Get them to consider how different sensors could help but also the problems with robots being near human workers * Ensure time is given to discuss the morals and ethics of replacing humans with automated workforces | |
| Making | |
| There are no making activities in this lesson. | |