MindSET-do

Year 7 – Infra-red sensors and Arduino Lesson 5

Learning Intentions	Lesson Outcomes
• Students recognise the use of closed circuits • Students explore the features of an Arduino and follow and modify algorithms • Students use and manipulate branching in Arduino Software • Students experiment with loops and create solutions to challenges	• Learn about infra-red sensor • Learn how logic (branching) works • Learn how subroutines help our code easier to read and maintain • Build an infra-red proximity sensor • Work collaboratively to complete tasks

Australian Curriculum Content Descriptors	Australian Curriculum General Capabilities
Digital technologies - Design algorithms represented diagrammatically and in English, and trace algorithms to predict output for a given input and to identify errors (ACTDIP029) **Digital technologies -** Implement and modify programs with user interfaces involving branching, iteration and functions in a general-purpose programming language (ACTDIP030) **Design technologies -** Analyse how motion, force and energy are used to manipulate and control electromechanical systems when designing simple, engineered solutions (ACTDEK031)	**Critical and creative thinking** – inquiring – identifying, exploring and organising information and ideas **Critical and creative thinking** – generating ideas, possibilities and actions **Critical and creative thinking** – reflecting on thinking and processes **Critical and creative thinking** – analysing, synthesising and evaluating reasoning and procedures

Assessment

Summative assessment

Students record algorithms as well as completing the sheet “bringing it together”.

Phase/Slide	Learning Activity	Resources
Slide 1 - 3	• Greetings • Introduction • Acknowledgement of Traditional Custodians • Lesson outcomes	PowerPoint

Phase/Slide	Learning Activity	Resources
Slide 4 – 5 Evaluate	• Revision: electric motors	PowerPoint and video
Slide 6-9 Engage	• What is an infra-red sensor? • Creating a working infra-red sensor • Revision – INPUT & OUTPUT pins	PowerPoint Arduino kits for students
Slide 10-12 Engage Explain	• Logic and branching • Introduce if…then • Introduce while…then	PowerPoint
Slide 13-14 Explain	• Comparison operators • Used to see if something is equal (=) to something else • Explore difference between if and while	PowerPoint
Slide 15 Explore	• Creating an infra-red proximity sensor • Create a setup as shown on the diagram	PowerPoint Arduino kits for students
Slide 16 Explain	• Talk through the while statements in effect • Copy down the code	PowerPoint Arduino IDE
Slide 17-18 Explore	• Explain how sub-routines work • Show an example of sub-routines working and talk through it with students	PowerPoint
Slide 19-20 Evaluate	• Copy all relevant code somewhere to be used • Use the code with sub-routines • Challenge: add a second sensor and LED	PowerPoint Arduino IDE
Slide 21-24 Packup	• Complete online survey • Talk about information learned • Pack up materials • Acknowledgement	PowerPoint Arduino kits for students