

STEAMS Kit - Programmable Electronics

Supporting the teaching and learning of digital technology for the NZ Curriculum

An “everything included” hands-on electronics kit for interdisciplinary learning designed to:

- Engage varying levels of ability
- Embed creativity
- Develop problem solving skills
- Encourage innovation



Affordable

Scalable

Expandable

Each Arduino-based kit includes:

- Input/output devices that sense and control Light, Sound and Motion
- STEAMS hooks to show creative ends
- 10 one-hour lessons that are NZ Curriculum based in Science (Physical World 3-5) and Digital Technologies (Computational Thinking, Designing and Developing Digital Outcomes 2-5)
- Comprehensive Teachers' Guide
- Expandable for Primary and College Level Students

Sold in crates of 20 kits for \$1000 - Order at web@ministryofinspiration.org

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Science - **T**echnology - **E**ngineering - **A**rts - **M**aths - **S**ociety

Developed in conjunction with the Ministry of Education



Lesson Contents:

- 1 What is Electricity** To understand the fundamental principles of electricity, basic electrical components and how a circuit is made.
- 2 Make a Breadboard** To understand how an electrical breadboard works and how current flows around it.
- 3 Resistance** To learn how to make a circuit on a breadboard with an LED, a resistor and a power source.
- 4 Blink** To make an LED blink off/on by controlling voltage from 0v to 5v through programming the Arduino.
- 5 Digital Dim** To change the rate of blinking to such a high rate that the LED appears to be dimmer.
- 6 Analogue Fade** To make the LED fade on and off by varying the voltage.
- 7 RGB Led** To control a tri-colour LED to produce different colours
- 8 The Motor** To control a small electric motor using analogue voltage and to understand more about the mixing of colours.
- 9 Motor Control** To control a small electric motor using a potentiometer and/or a push-button to control the voltage and to understand more about the mixing of colours.
- 10 Innovate** To work as a team (groups of 2 or 3) to incorporate the lessons learned with the STEAMS Programmable Electronics kit into an innovative, creative and interactive 'robot'.

The Teachers' Guide contains detailed explanations to each lesson, extension concepts and answers to students' questions.

A series of projects (lessons 11-20) is under development which are designed to extend learning and encourage the student to use the skills and techniques learned from the lessons (1-10) to simulate real-world mechatronic systems, e.g. traffic lights, piano, LED dice game, lie detector, and much, much more!