Meadows First School Computing/DT/Science Curriculum

Year 3 Knowledge Organisers

Unit 3.R PHYSICAL SYSTEM ROBOTICS

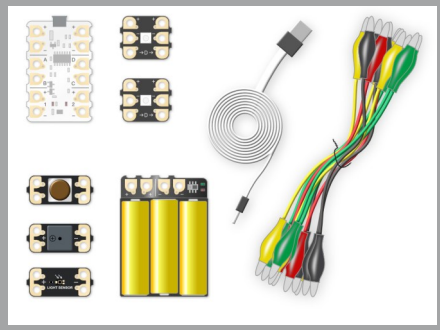
Key Learning

Design, write and debug programs that accomplish specific goals, including **controlling or simulating physical systems**

Learn Crumble Robotics software interface

Observe and manipulate computer system interacting with physical system

Key Resources



Crumble Robotics kit
(1 to 3 children)

Crumble programming software

Key Vocabulary

Hardware

Battery pack—provides the power to the circuit, 3xAA batteries sit inside the battery pack.
LED—Light emitting diode, a modern style of lightbulb that is much smaller and can be programmed to change colour and turn on and off. An electrical current passes through two parts inside the LED to cause it to glow.
Sparkle—a programmable LED that you can connect with crocodile clips.
Crocodile clips—electrical wires wrapped in plastic with metal grips at either end to connect electrical devices together.
Crumble Motherboard—the central processing chip that controls everything in the circuit. Essentially a very small computer that everything connects to and listens to. Your program is stored on the motherboard.
Data cable—allows you to connect the motherboard chip to a computer so that you can transfer your code from the computer to the motherboard.
Light sensor—an input that measures how much light is in the air and gives this information to a computer.
Buzzer—an output device that vibrates when an electrical current is passed through to make a sound.
'Push To Make' switch—a switch that only allows the electrical current to pass through when the button is pushed down. These can be used to control when the program runs and stops.

Software

Code blocks—colour coded programming blocks that click together to create coding sequences.
Algorithms—the step by step processes needed to complete a task
Code—the language algorithms are written in for computer systems to understand.

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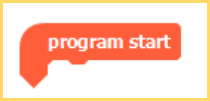
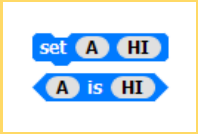
Key Images

Crumble Robotics software desktop logo

Execute program block



Input program blocks



Sparkle program blocks

Timer/sequence program blocks

Key Questions

What are the similarities between coding in 2code and Crumble?

Both mirror the Scratch block input interface which will allow for further transitions between programs later on.

Different command areas are colour-coded for ease of use.

Both make use of sequence and timer blocks for more efficient coding practise.

Do crocodile clips need to be colour coordinated?

All crocodile clips are safe to use, easy to connect and work exactly the same regardless of colour.

For ease of use, matching colours for polarity or linking similar input and output devices may be helpful for keeping track of your connections but are not necessary.

Why is there a sparkle 0 and what is HI and LO?

The first of each output device is set at 0 with subsequent devices going up with a 2nd matching device being 1. Many projects will involve using 2 sparkles which will be identified as sparkle 0 and 1.

HI and LO refer to the 'push to make' switch operation. HI means the electrical current is passing through (button depressed) and LO mean no current is passing through (button up) .