



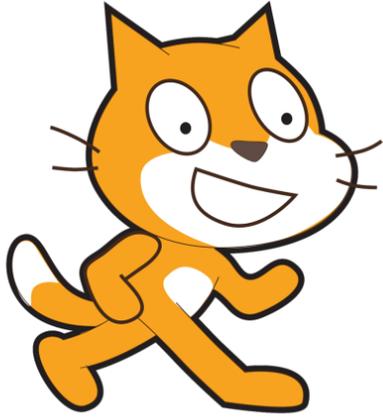
Visual Programming with the Genuino 101* board and Scratch

Visual programming languages like Scratch are a great way to introduce coding and computational thinking. The interface is intuitive and easy to use and also meets the needs of the Digital Technologies Curriculum for younger students. With the aid of the S4A or the 'Scratch for Arduino' application, students can start programming their Arduino with a Scratch infused interface.

Please note this is a **level 2 guide** and assumes you have mastered basic Genuino 101 board connectivity, and have an understanding of both Scratch and Arduino.

Quick Check

1. You will need an Arduino board such as a Genuino 101 board.
2. You will need to have installed the Arduino IDE, visit <http://bit.ly/101-101> for all the instructions.



Open S4A

Now you should be ready to begin your programming journey.

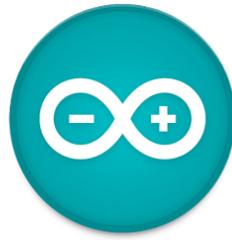
1. Open **S4A**. (There should be an icon on your desktop.)
2. You will notice the work-space closely resembles the **Scratch** interface.
3. Begin by importing a picture of your Arduino to avoid confusion. Click on **Costumes > Camera** and then take a picture of your board.
4. Before we begin explore the **functions available** by clicking the **categories** in the top left.



Next Steps

The next steps are up to students imagination and exploration. The code to the right adds in a photo-resistor to control the LED, the photo-resistor being connected to Analog input AO. I used the Seed Studio Grove kit as outlined in this guide <http://bit.ly/101Plug-n-Play>

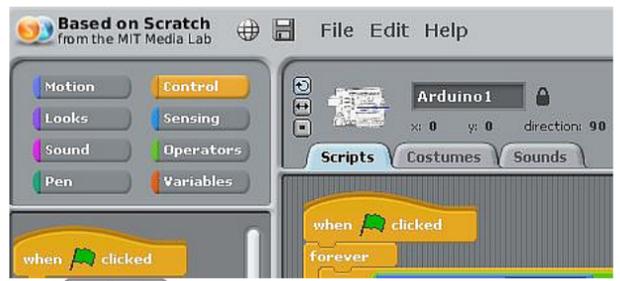
STEP 01



Download and install S4A

1. Visit <http://bit.ly/101-Scratch> and download the latest version of S4A for your system. (It should begin automatically.)
2. Open **Arduino** and paste the following sketch in to the workspace <http://bit.ly/S4ASketch>
3. Make sure your Genuino 101 board is connected and **upload** the sketch. (If you are experiencing difficulty revisit the introductory guide at <http://bit.ly/101-101>)

STEP 02



Arduino 1 port: COM20	
Analog0	759
Analog1	115
Analog2	85
Analog3	81
Analog4	90
Analog5	94
Digital2	true
Digital3	true



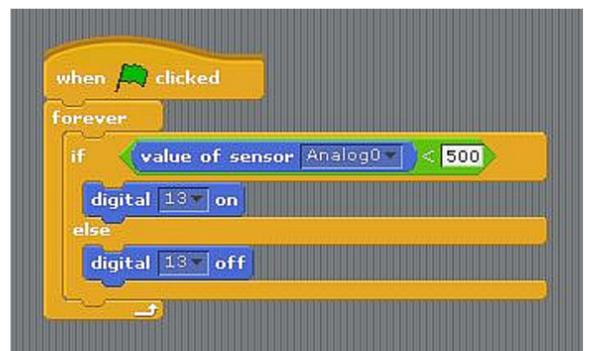
Beginning with S4A

S4A is an extremely intuitive way to program for students experienced in Scratch.

1. Begin with **Control** blocks students are familiar with.
2. Add in some **motion** control to start the Arduino functioning.
3. You could start by **replicating** the sequence on the **left** exposing students to some of the available options. This code will command the integrated LED to blink every second.
4. Once completed click the **Green Flag** (top right) to see your Arduino come to life.

STEP 04

STEP 05



Going Further Resources

To go further students will need to understand what parts of their board can be controlled by S4A:

1. Visit <http://bit.ly/101-Scratch> and scroll down to the **Connectivity** section.
2. For further examples **scroll down further** for very effective **workshop materials and basic examples**.
3. Encourage your students to **share** their work by adding a **photo** (costume) of their completed circuit and then saving and sharing their work with others or online.

This guide was produced with information from:

<http://s4a.cat/> Access this site for further and more detailed information.