

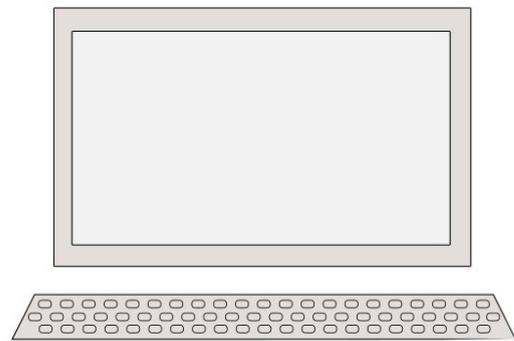
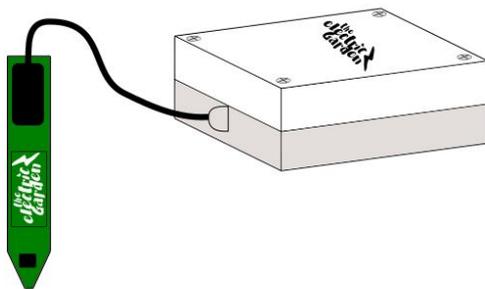


## Modelling device functionality in Scratch

When designing a new product, we can use programs like Scratch to model what our new device will be able to do. This document will show you how to model the functions of the Electric Garden, however you should model the functions of your own design.

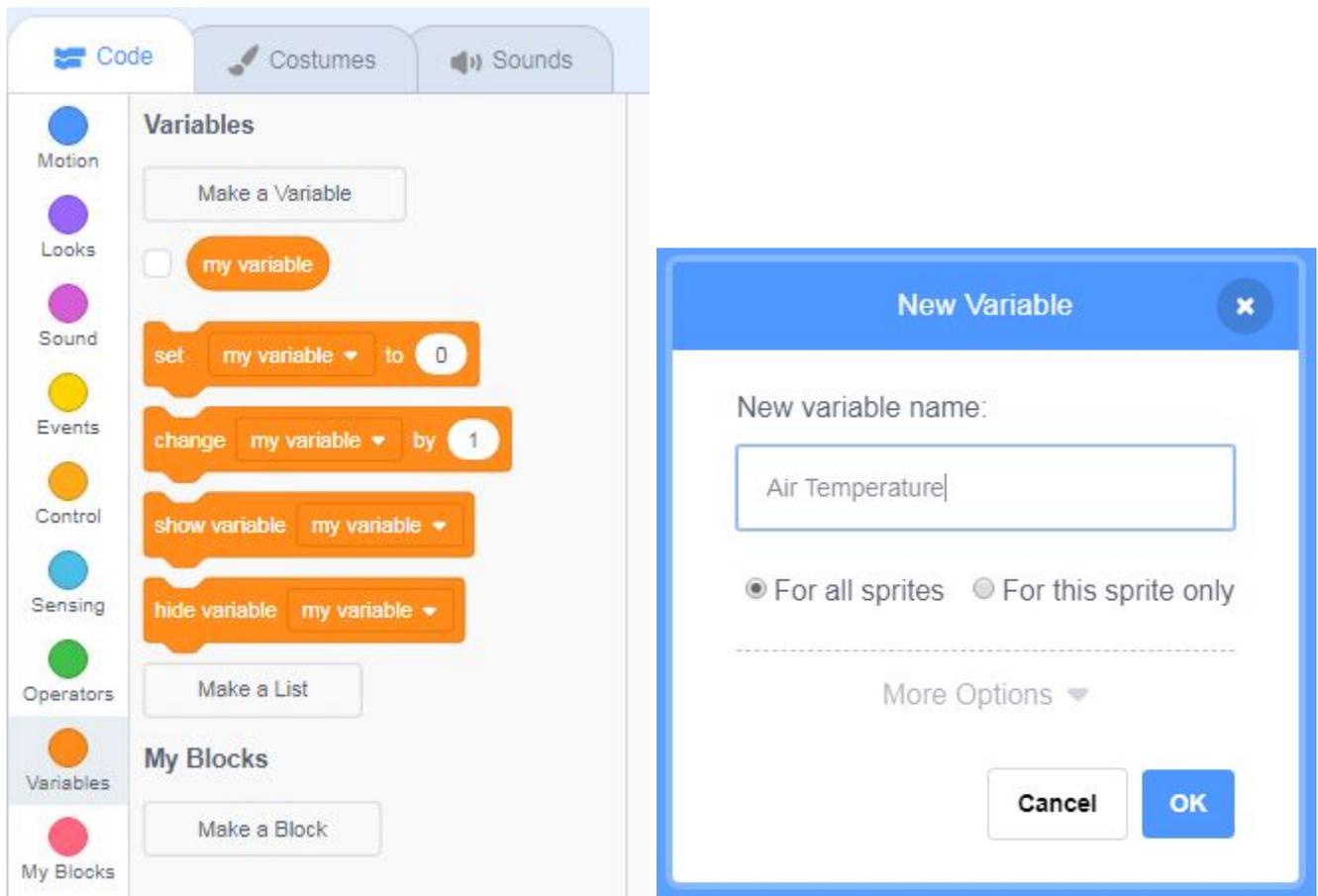
First create a digital sketch of your new device. This could be using the paint tool in Scratch, using an inbuilt drawing program on your computer like MS Paint, or using a special drawing program such as Inkscape. If you are not using Scratch to create your image, then save it as a .PNG and upload it to Scratch as a sprite.

If your device talks to another device such as a computer, create another Sprite to represent this.

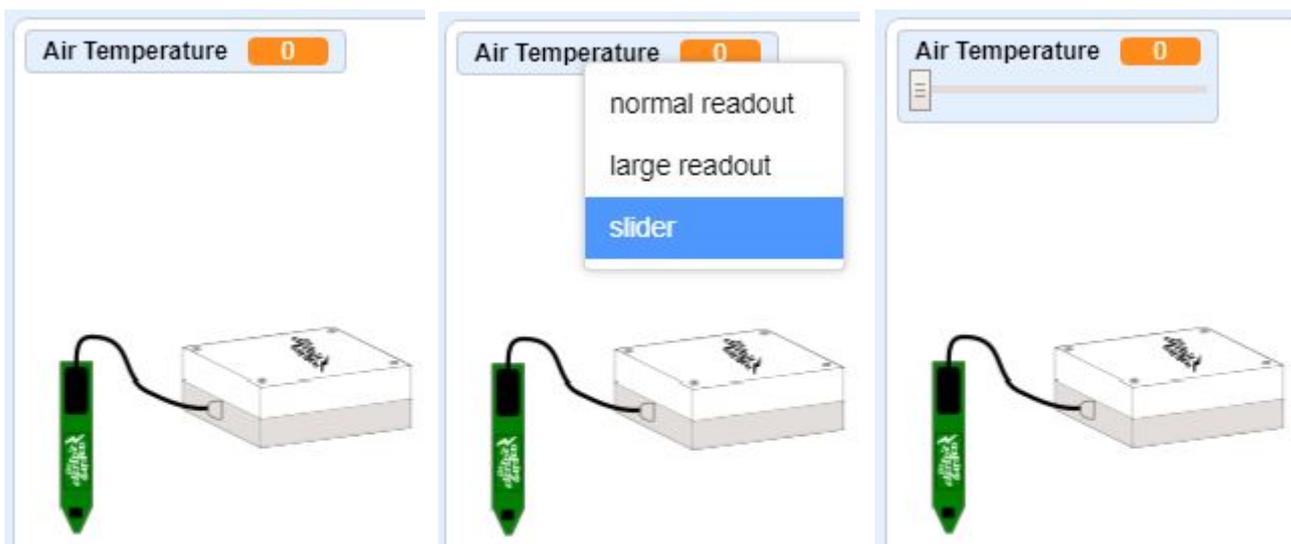


The Electric Garden can measure the air temperature. We can define the temperature by using a variable. A variable is a small chunk of information that a computer can store and retrieve later.

Head to variables, and click 'Make a variable.' Give your variable a unique and easy to understand name, such as 'Air Temperature.'



Your variable should appear in the stage area. Right click and change the readout type to slider as this will make it easier for us to change the variable.



The Electric Garden sends data to a cloud via a gateway. We can model this sending of data by using Broadcast.

Broadcast lets us send signals to a different part of our program when something has happened or to make something happen. From events, find the 'broadcast' block and drag it into the programming area. Attach it under a 'when flag clicked' block, also from events. Click the arrow and select new message from the dropdown menu. Give your message a unique and easy to understand name.



When plugged in to the mains, the Electric Garden can send data every 10 seconds. We can demonstrate this by using a forever loop and a wait block.



When the Electric Garden broadcasts its data, we want the computer to pick up the signal and display the temperature. From events, find the 'when I receive' block and drag it into the computer's programming area.

When the computer receives information from the Electric Garden, we want it to display the data. We can model this using the 'say' block from Looks.

As we have saved the air temperature as a variable, we can use this to tell the computer what the temperature is. From variables, find the block that you created to store the air temperature information and drag it into the 'say' block.

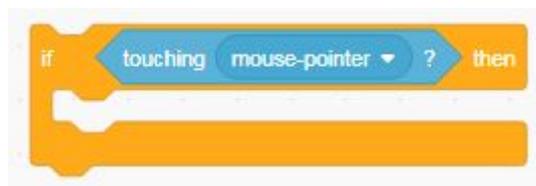


We can improve our current data display by using a join block. The join block lets us put two pieces of information together, like a description about the variable and then the variable.

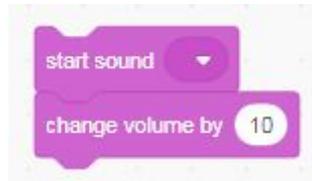


What can your own design do? Or can you think of any additional features for the Electric Garden?

You could use an if statement and a 'touching mouse pointer' block to model something happening if a person walks past.



Maybe your device has an alarm that gets louder and louder once it has been triggered?



Could something cause your device to switch off completely?

