# Using the Raspberry Pi's GPIO Pins with the PIBRELLA AND SCRATCH

The Pibrella is a GPIO add-on board for the Raspberry Pi. This means that it plugs into the pins on the side of the Pi.

It lets you bring your programming into the real world by being able to control:

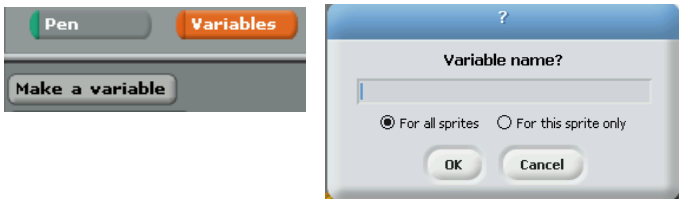
- A red LED
- An amber LED
- A green LED
- A buzzer
- A button
- Other inputs and outputs.

We're going be using a version of Scratch called ScratchGPIO.

1. On your Pi, start up ScratchGPIO 4. Make sure it's version 4 that you're running.
2. A box saying “Remote sensor connections enabled” will come up. Just click OK.

The first thing we're going to do is to light up the red LED.

1. Create a Variable called “AddOn” and set it to have the value “Pibrella”.




2. Create a “when flag clicked” Control and add the Variable to it:


This will make sure that the Pibrella is 'loaded' every time you run your program.

3. Now add a Broadcast control and create a new broadcast called “RedOn”. This will send the signal to turn on the LED.


Run your program and you should find the LED comes on. Congratulations! You've written your first ScratchGPIO program with the Pibrella.

You can turn the LED off by using the broadcast Control again and creating a new broadcast called RedOff.

You can make the LED flash by creating the program on the right.

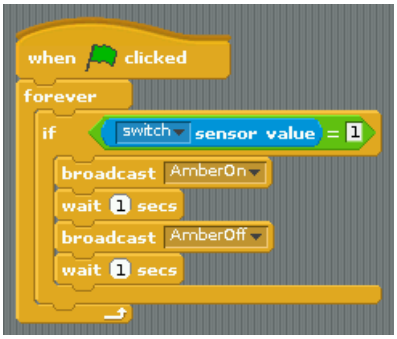

By using these broadcast Controls, you can do a lot with the Pibrella. A list of the broadcast Controls is given below.

- RedOn – Red LED on
- RedOff – Red LED off
- AmberOn – Amber LED on
- AmberOff – Amber LED off
- GreenOn – Green LED on
- GreenOff – Green LED off
- OutputEon – Turn output E on (and the little LED)
- OutputEoff – Turn output E off (and the little LED)
- OutputFon, OutputFoff, OutputGon, OutputGoff, OutputHon, OutputHoff – I'm sure you can guess what these do?

For the buzzer, you can create a broadcast Control like this one: 

You can change the number to make slightly different pitches. The buzzer isn't all that good but it does mean you can make some kind of sound, even if it's not a very nice one!

For the switch, you can detect whether it's been pressed or not by making the following example program which is a mixture of Controls, an Operator and a Sensor.




Try putting this program in and pressing the button. You should find that the amber light comes on.

You can do a lot with the Pibrella and so now it's up to you. Come up with some ideas.

For instance...

- You could do a traffic light sequence.
- You could even have the sequence be interrupted when the button is pressed.
- You could write a reaction game where Scratch will flash the red and green lights and count the number of times you accurately press the button when it's green, something like that. It's up to you – so hack away!
- You could combine your Felix and Herbert or Whacking game work and make the LEDs light up when you score.