A - Starting Lights

Learn how to use the Sparkle module by creating some starting lights for a race around the planet.

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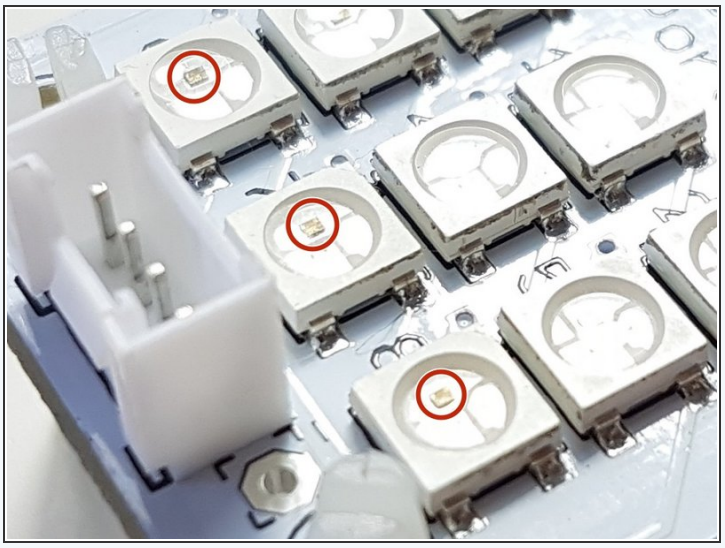
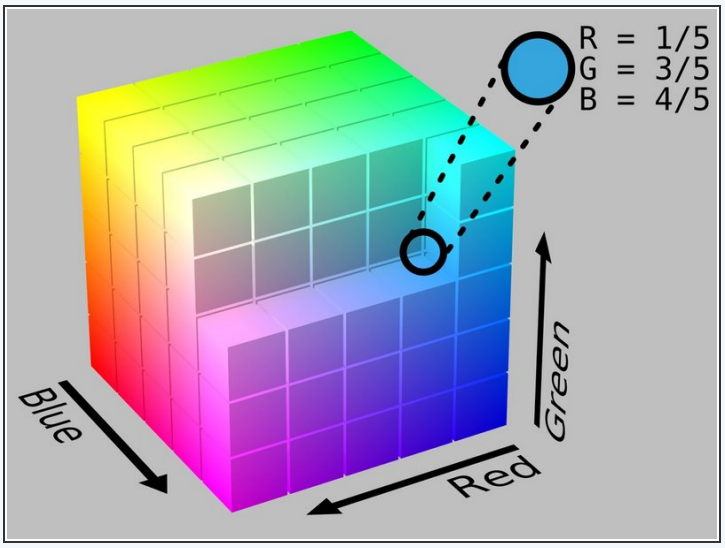
INTRODUCTION

Learn how to use the Sparkle module by creating some starting lights for a race around the planet.

Step 1

What are Sparkles?



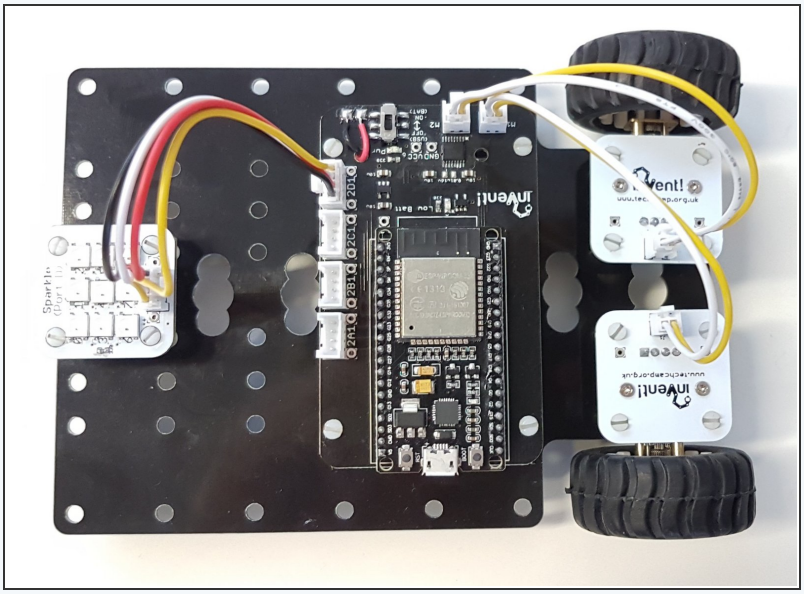


- Sparkles are very useful - they are **LEDs,** just like the red/green LED from before, but much cleverer!
- They have small chips inside them, which allow you to control many LEDs using **just one output.** If you look really closely you might be able to see them.
- They are also **three LEDs in one** - there is a **red**, **green** and **blue** LED in every sparkle.
- We can control these three internal LEDs **separately,** and mix them together to create **any colour!**
- This is the same way pixels in your computer screen work - **have a look at the chart** to see all the possible colours we can make.

Step 2

Connect your Sparkle Module

- Build up your robot like the picture.
- Sparkles must always be plugged into **d1** - this is very important as otherwise they won't work!



Step 3

Test Your Sparkles

- For now, let's **test the sparkles** by building the simple program in the picture - hopefully they **all turn red** when you **program your robot!**

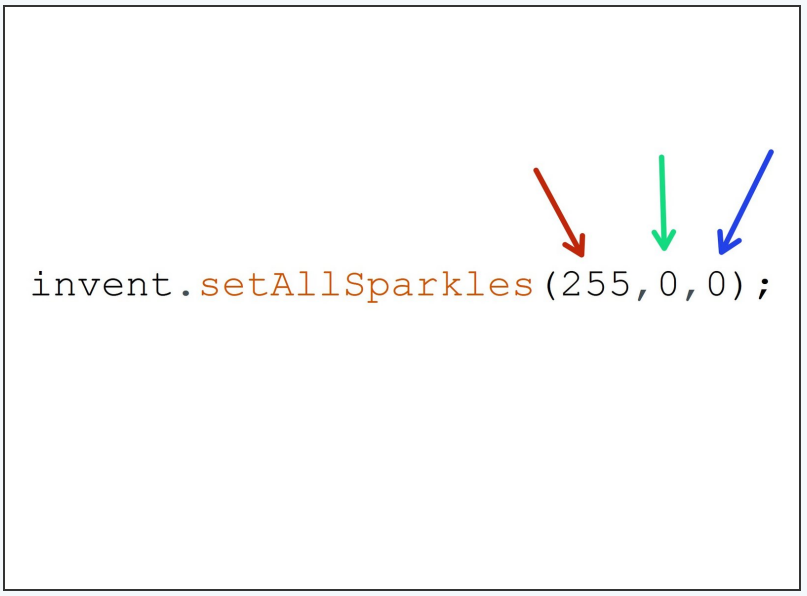
⚠ Don't stare at the sparkle board for too long - it's very bright!

```
#include <invent.h>

Invent invent;

void setup() {
  invent.begin();
  invent.setAllSparkles(255,0,0);
}

void loop() {
}
```

Step 4

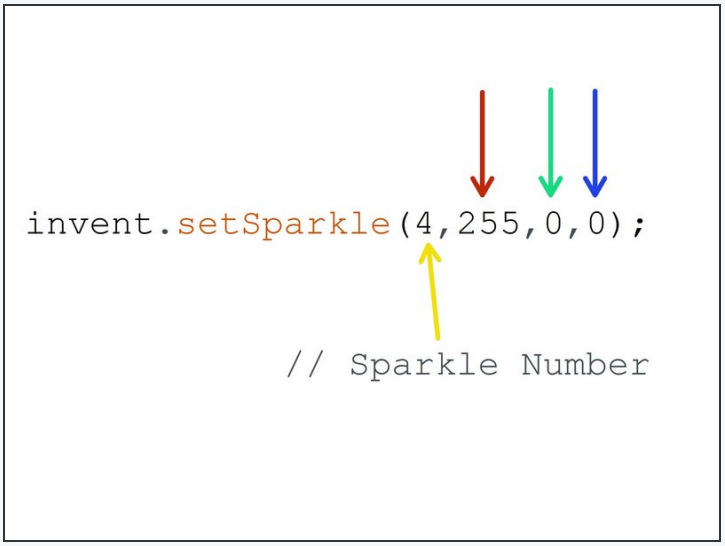
Different Colours

- It's really easy to control the red, green and blue LEDs **separately** to make **any colour we like.**
- The three numbers in the **invent.setAllSparkles()** function set the red, green and blue levels of the LEDs - they can be any number from **0-255**
- **Try changing the numbers** and see what colours you can create!



Step 5

Different Sparkles, Different Colours

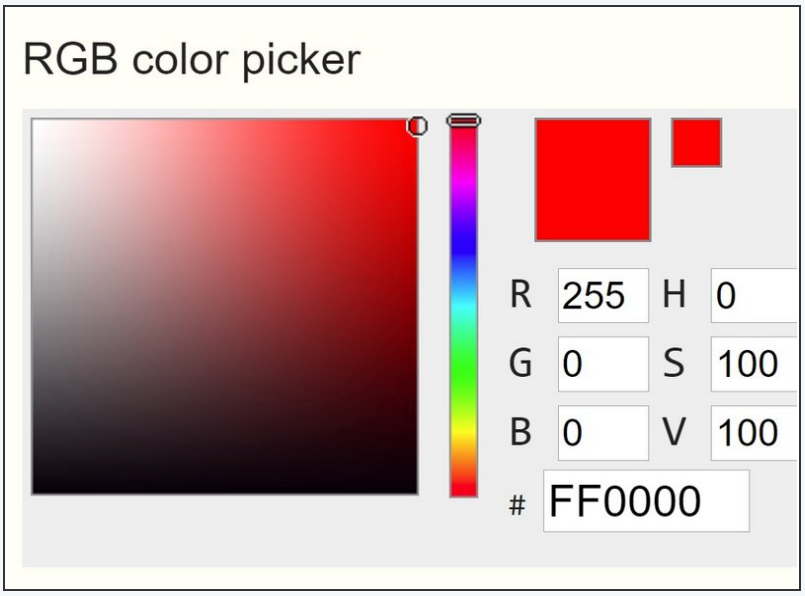


- Remember, we can also control each sparkle **individually!**
- We can use **invent.setSparkle** to set the colours of individual sparkles. This function needs **4** numbers - the **number** of the sparkle to set, and the **r,g and b values** as before.
- **In programming numbers start from 0,** not 1 - so for nine sparkles, the first is 0, the second is 1 and the last is sparkle 8.
- Use **three** of the individual sparkle set blocks to **set three sparkles to a different colour.**

Step 6

Choosing Colours

- It can be difficult to know what to set the red, green and blue to to get a **specific colour!**
- [Try this online colour picking tool (http://www.rapidtables.com/web/color/RGB_Color.htm)](http://www.rapidtables.com/web/color/RGB_Color.htm) - you can pick any colour you like, and it will give you the **red, green and blue values** you need.



Step 7

Extension Challenge - Starting Lights

- Let's make a set of **starting lights** for a race across the planet surface.
- Check out the F1 starting lights in the video - can you put together a program using **sparkle** and **wait** blocks to **make your own?**
- The lights should **turn red 1 at a time,** then **all go green** at the same time.