

FUZE BASIC

Beginner's Worksheet: 2a "Flashing Lights"

Time for some electronics. In this project we are going to wire up an **LED** to our **input/output (I/o) board**. Follow the instructions below **very carefully** to make the circuit - don't hesitate to ask for help!

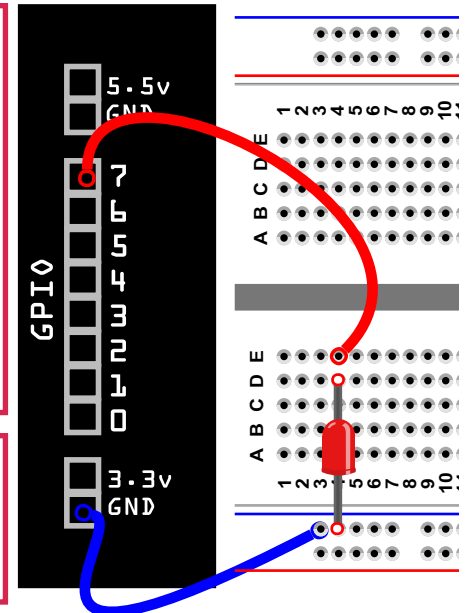
We need to add an **LED** to the breadboard. Unlike the one displayed to the right, the FUZE breadboard is black. It sits comfortably at the top of the unit.

Pick an **LED** from the component box and connect it as illustrated here:

NOTE: the **LED** has one slightly longer leg. This should be at the top.

The **red** wire connects from **GPIO pin 7** to the top pin of the **LED (E4)**.

The **blue** wire is connected from the **GND** (ground) pin to the first available hole along the **blue** line. The short **LED** leg goes next to the **blue** wire.



PINMODE (7, 1)

DIGITALWRITE (7, 1)

Press [**F2**] to go to the **FUZE BASIC editor**, write the code on the left and **RUN** the Program [**F3**]

PINMODE(7, 1) tells the computer that **GPIO pin 7** is set to **1 (on)** for output.

DIGITALWRITE(7, 1) sends an electrical current (**1**) to pin **7**.

DIGITALWRITE (7, 0)

Turn **off** the electrical current to the **LED** by sending pin 0 an **off** signal (**0**)

PINMODE (7, 1)

LOOP

DIGITALWRITE (7, 1)

WAIT(0.5)

DIGITALWRITE (7, 0)

WAIT (0.5)

REPEAT

Remember the **LOOP** command from the first sheet? We're going to use that again here to make our light **flash**!

Type in the code to the left then **RUN** the program! [**F3**]

Challenge: How could you make the **LED** flash **faster** or **slower**?

Challenge: On the right we have written the code to flash two **LEDs**. First you will need to connect a second **LED** to the **IO** and breadboard (see pic). Add the **BLUE** lines of code to your program.

Can you change things around so the **LEDs** flash **alternately** (when one is on the other is off)?

PINMODE (6, 1)

PINMODE (7, 1)

LOOP

DIGITALWRITE (7, 1)

DIGITALWRITE (6, 1)

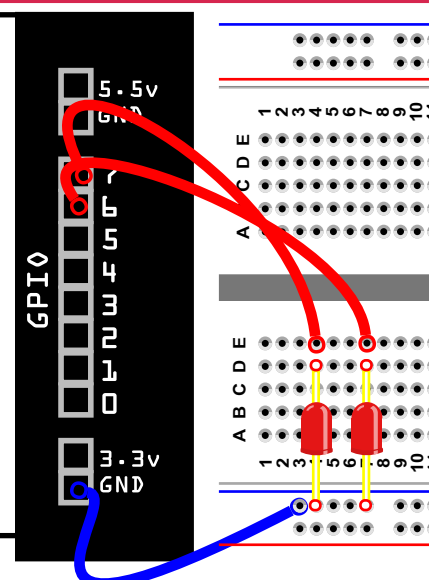
WAIT(0.5)

DIGITALWRITE (7, 0)

DIGITALWRITE (6, 0)

WAIT(0.5)

REPEAT



FUZE BASIC

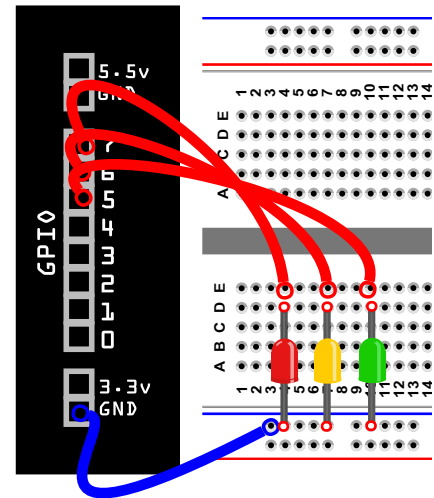
Beginner's Worksheet: **2b** "Traffic Lights"

Let's combine everything we have learned into one big program. Sounds good?

We are going to make Traffic Lights! With a twist.

Set up your **GPIO board** and **LEDs** to look as they do in the picture to the right:

Next, go into the editor [**F2**] if you aren't already, and begin a **new** program. Copy the code below - there a couple of **new** commands - check the box on the right for their explanation.



```
PINMODE ( 7, 1 )
PINMODE ( 6, 1 )
PINMODE ( 5, 1 )

FULLSCREEN = 1

LOOP
CLS
INK = RED
PRINTAT (TWIDTH/2, THEIGHT/2); "STOP. "
DIGITALWRITE ( 7, 1 )
WAIT (1)

CLS
INK = YELLOW
PRINTAT (TWIDTH/2, THEIGHT/2); "GET READY. "
DIGITALWRITE ( 7, 0 )
DIGITALWRITE ( 6, 1 )
WAIT (1)

CLS
INK = GREEN
PRINTAT (TWIDTH/2, THEIGHT/2); "GO!!! "
DIGITALWRITE ( 6, 0 )
DIGITALWRITE ( 5, 1 )
WAIT (1)
DIGITALWRITE ( 5, 0 )
WAIT (1)

REPEAT
```

We know this one! **PINMODE** sets up our pins to receive electricity.

Okay, some new things here.

PRINTAT tells the computer we want to print words at a **specific place**.

(TWIDTH/2, THEIGHT/2) tells the computer **where** we want our words! In this case, it will be in the **middle** of the screen.

DIGITALWRITE (0, 1) turns our first light on.

CLS clears the screen each time, so that we have a fresh page to work with.

Then we repeat the process, changing the **colour** of the **ink**, the **words** we **print**, and the **LED** which comes on at each time.

Each time we repeat the sections, we are **also** turning **off** the **previous** light, and turning **on** the **next** one!

Try changing the words and colours as you like, it is **your** program, after all!