



# LED WORKSHEET #1

1. Type in this missing parts  
Beware of the upper and lower case!

```
#include <EngduinoLEDs.h>

void setup() {
  // put your setup code here, to run once:
  EngduinoLEDs.begin();
}

void loop() {
  // put your main code here, to run repeatedly:
  EngduinoLEDs.setAll(RED);
}
```

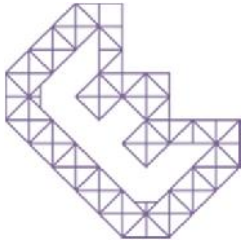
2. Press this button to  
“upload” to Engduino



3. Other colours to try  
(all upper case):

- RED
- GREEN
- BLUE
- YELLOW
- MAGENTA
- CYAN
- WHITE
- OFF

These are all the colours we  
defined. But we can mix more!



## LED WORKSHEET #1

1. Use RGB (Red, Green and Blue) to make a new colour. Mix your own colour

```
#include <EngduinoLEDs.h>

void setup() {
  // put your setup code here, to run once:
  EngduinoLEDs.begin();
}

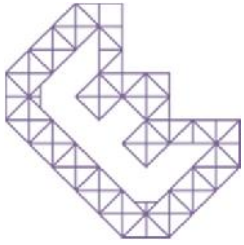
void loop() {
  // put your main code here, to run repeatedly:
  EngduinoLEDs.setAll(100, 50, 2);
}
```

The number goes from 0 to 255. 0 means the colour is off. 255 is the maximum brightness. Change these numbers to mix your own colour.

Can you mix a pink colour?

2. Press this button to “upload” to Engduino





## LED WORKSHEET #1

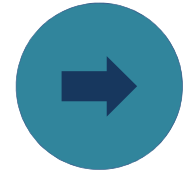
1. Now we learn to make a sequence of lights

```
#include <EngduinoLEDs.h>

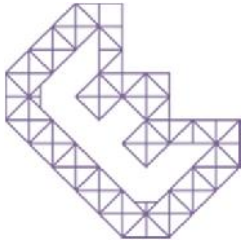
void setup() {
  // put your setup code here, to run once:
  EngduinoLEDs.begin();
}

void loop() {
  // put your main code here, to run repeatedly:
  EngduinoLEDs.setLED(0, RED);
  EngduinoLEDs.setLED(1, GREEN);
  EngduinoLEDs.setLED(2, BLUE);
  EngduinoLEDs.setLED(3, YELLOW);
  EngduinoLEDs.setLED(4, GREEN);
  EngduinoLEDs.setLED(5, MAGENTA);
}
```

2. Press this button to “upload” to Engduino



We have 16 LEDs. Number 0 to 15. This is because in programming, we usually starts at 0.



## LED WORKSHEET #4

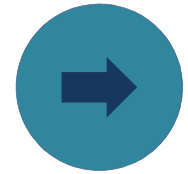
1. Let's do some blinking

```
#include <EngduinoLEDs.h>

void setup() {
  // put your setup code here, to run once:
  EngduinoLEDs.begin();
}

void loop() {
  // put your main code here, to run repeatedly:
  EngduinoLEDs.setAll(YELLOW);
  delay(1000);
  EngduinoLEDs.setAll(OFF);
  delay(1000);
  EngduinoLEDs.setAll(BLUE);
  delay(1000);
  EngduinoLEDs.setAll(OFF);
  delay(1000);
}
```

2. Press this button to  
“upload” to Engduino



*delay(1000) means delay 1  
second (1000 milliseconds)*

*Why don't you try making it  
blink faster or slower?*



## LED WORKSHEET #5

Here are some programming tricks:-

```
#include <EngduinoLEDs.h>

void setup() {
  // put your setup code here, to run once:
  EngduinoLEDs.begin();
}

int DD = 500;

void loop() {
  // put your main code here, to run repeatedly:
  for (int i = 0; i < 16; i++) {
    EngduinoLEDs.setLED(i, BLUE);
    delay(DD);
    EngduinoLEDs.setAll(OFF);
  }
}
```

### Variable

**int = integer.** We make a “variable” which has a type integer and name it **DD**. A variable stores a constant value or text. We can change the value of this variable in the program. Also, if we use variable in the program. If we decide to change the value later, we only need to change it in one place instead of many places.

### For-loop

In a for-loop, we define the start condition, the stop condition and step condition each time we go through the for loop. In this example, I would start from 0, each time we go through the for loop, it will add one to i until i=15.

i is also a variable! You can see that the value i changes in the program!

### Scope

{ } define the scope of our setup(), loop() and for-loop. Beware, the number of { open brackets must match the number of } close brackets!



# LED WORKsheet # 6

Let's make our LEDs go faster and faster

```
#include <EngduinoLEDs.h>
```

```
void setup() {  
  // put your setup code here, to run once:  
  EngduinoLEDs.begin();  
}
```

```
int DD = 500;
```

```
void loop() {  
  // put your main code here, to run repeatedly:
```

```
  for (int i = 0; i < 16; i++) {  
    EngduinoLEDs.setLED(i, BLUE);  
    delay(DD);  
    EngduinoLEDs.setAll(OFF);  
  }  
  //decrease the delay time  
  DD -= 50;  
  if (DD <= 0) {  
    DD = 500;  
  }
```

```
}
```

## If-statement

The “If-statement” in our example resets the value of DD if it is smaller than or equal to 0. So our lights continue to go round faster and faster repeatedly.

Now it is your  
turn to make a  
light display.