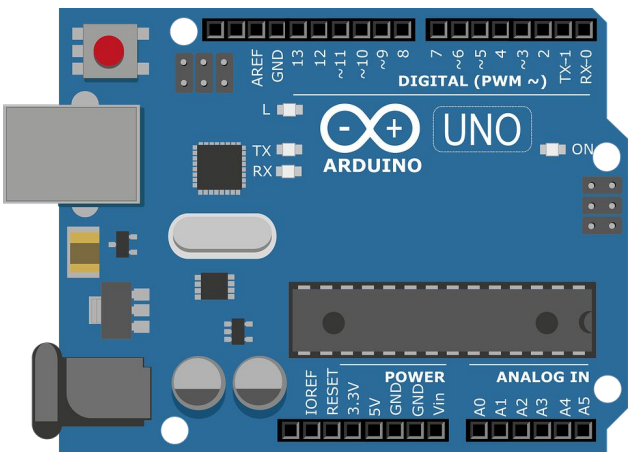
Arduino & LED Task Cards

Wiring Diagrams & Sample Code

What's included:
12 Task Cards
Wiring Diagrams
Sample Code



Teaching and Tech MAGIC

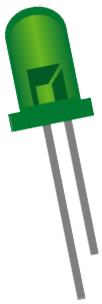
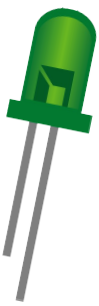

This ia the companion guide to the Arduino LED Task Cards found in my Teaching and Tech Magic store. This guide provides you with wiring diagrams and sample code to help teach students more about the Arduino.

Starting with LEDs helps students to quickly learn basics and build confidence with both wiring and programming skills.

The guide and task cards can be used with a physical Arduino kit as well as with the virtual Arduino found at Tinkercad.com under Circuits.


The task cards work best when completed in order. They start with completing a simple circuit with 1 LED and move on to complete more complicated blinking sequences with up to 3 LEDs.

The code provided is a sample of what a beginner can be used to complete the task. Students can use different pins numbers, speed variations, etc., as they choose. As students gain more advanced programming knowledge they will find shortcuts that will allow them to perform the same task with less code.

Vocabulary

setup - where the program starts. It initializes the pins and other variables. It will only run one time.

pinMode - lets the Arduino know if the specific pin will act as an input or output

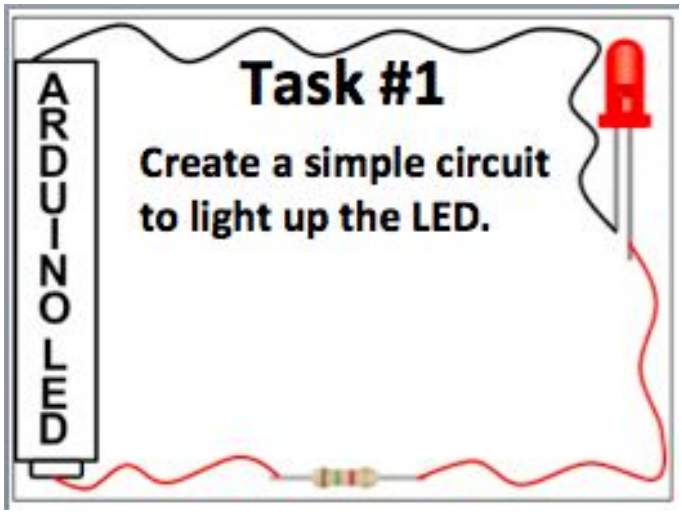
loop- where the action takes place. It will run over and over allowing the program to respond.

digitalWrite - assigns a HIGH or LOW value to a digital pin.

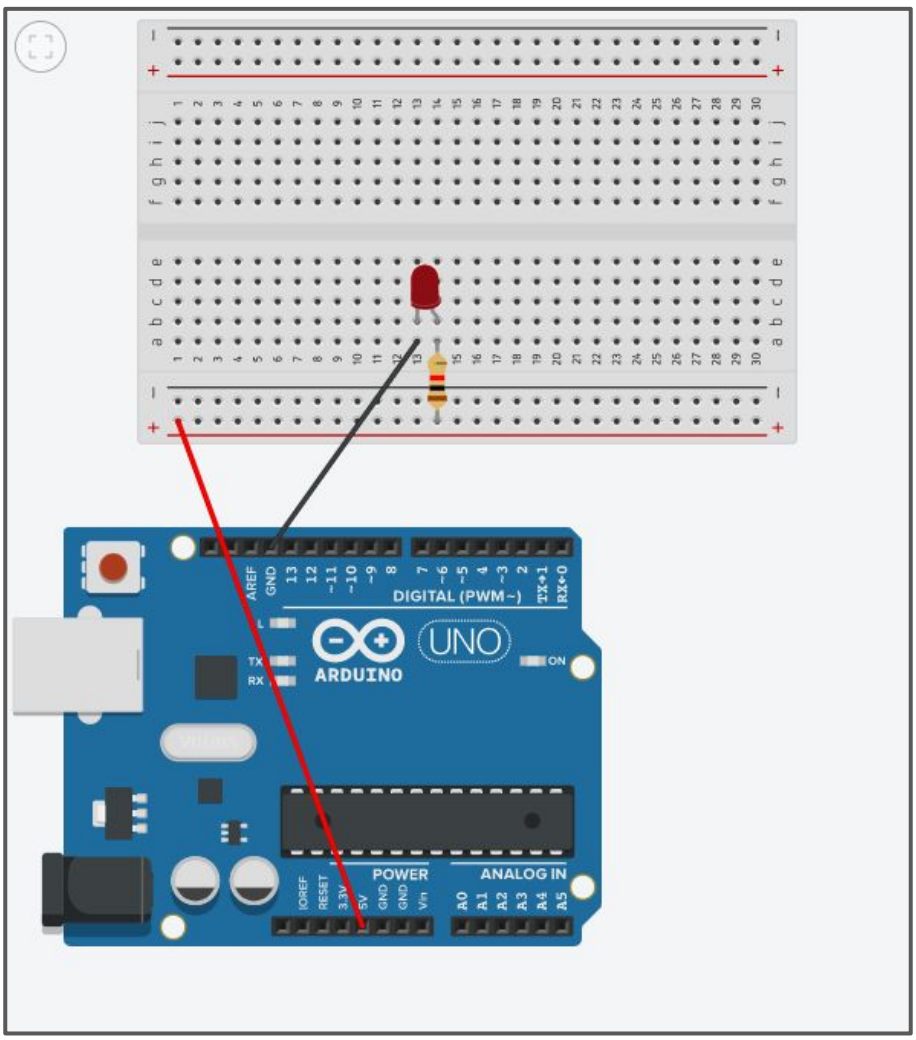
delay - pauses the program for the specific time listed in milliseconds.

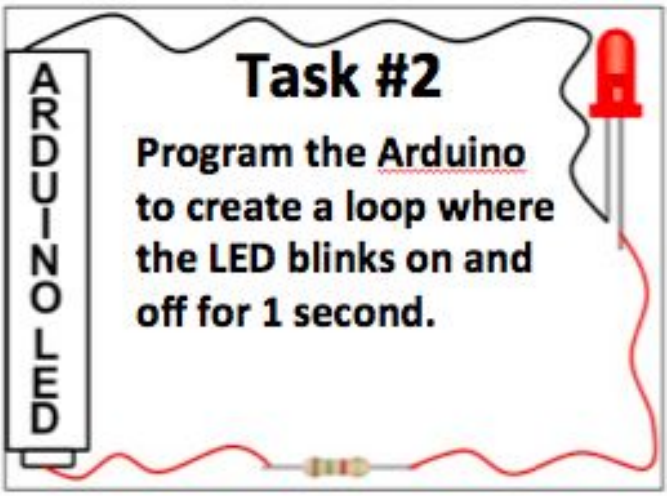
HIGH - increases the voltage to a digital pin or turns it “on”.

LOW - decreases the voltage to a digital pin or turns it “off”.



This task card does not require specific coding to run. The Arduino and computer simply act as a large battery.



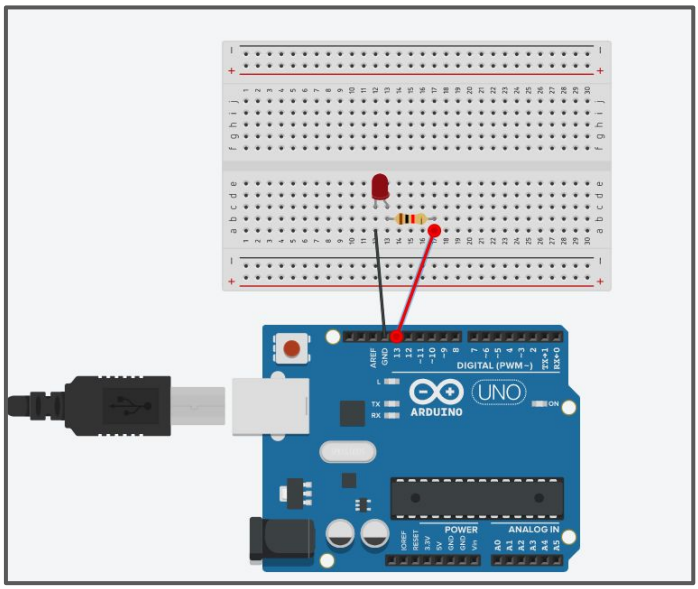


Code

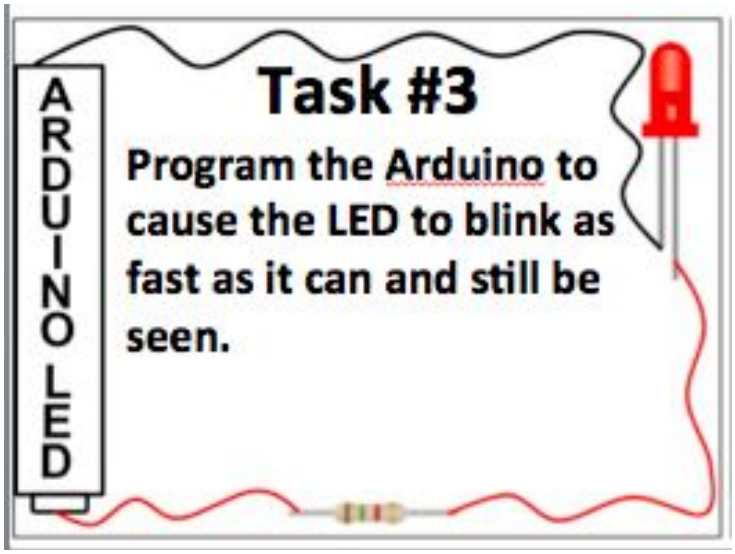
```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(13, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

Build



*Notes
When using the Arduino Software, instead of it specifically stating pin 13 in the code, it will use LED_Builtin. It states in the comments at the top of the program that LED_Builtin and pin 13 are one in the same.

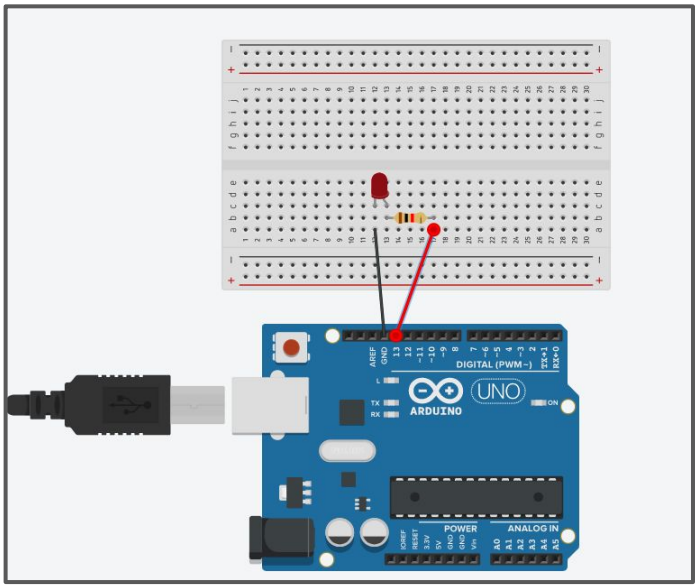


Code

```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(50);
  digitalWrite(13, LOW);
  delay(50);
}
```

Build



*Notes

1. When using the Arduino Software, instead of it specifically stating pin 13 in the code, it will use LED_Builtin. It states in the comments at the top of the program that LED_Builtin and pin 13 are one in the same.
2. The delay of 50 milliseconds may vary by device. Different numbers can be tested and used as long as the blink is still visible. A delay of 10 milliseconds or lower can be viewed through a cell phone camera with the video recording in SloMo.

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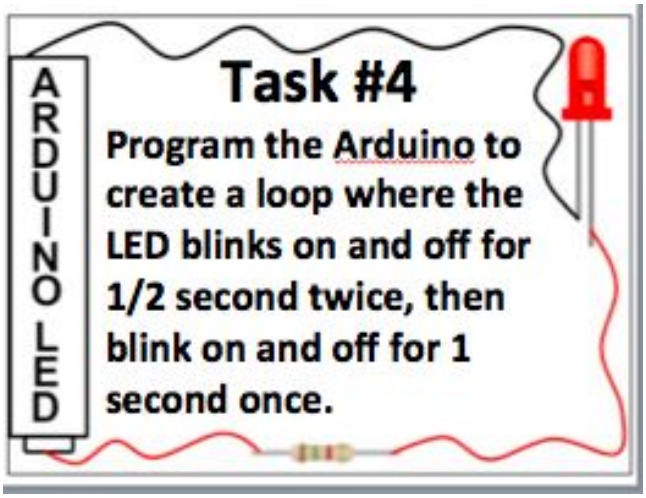
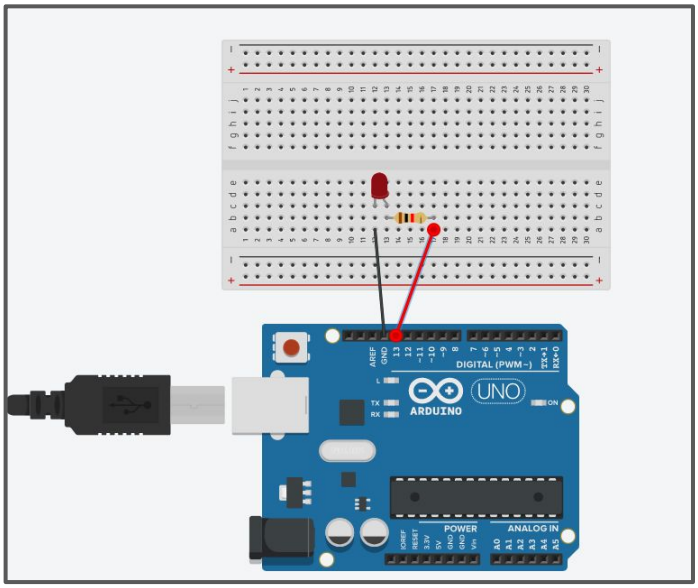


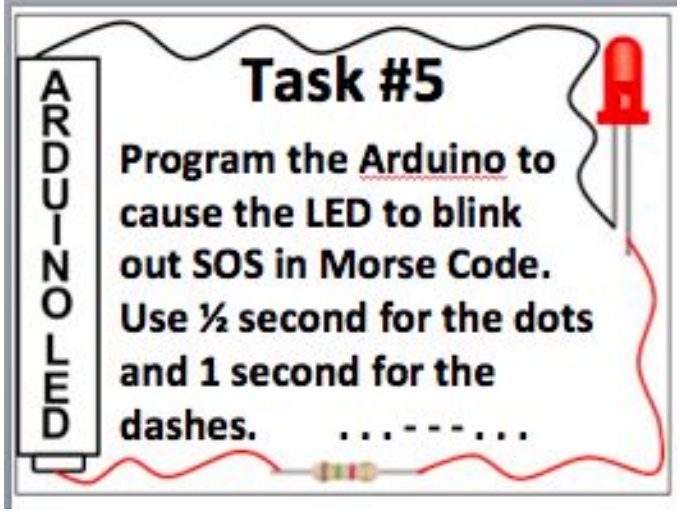
Code

```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(1000);
  digitalWrite(13, LOW);
  delay(1000);

}
```

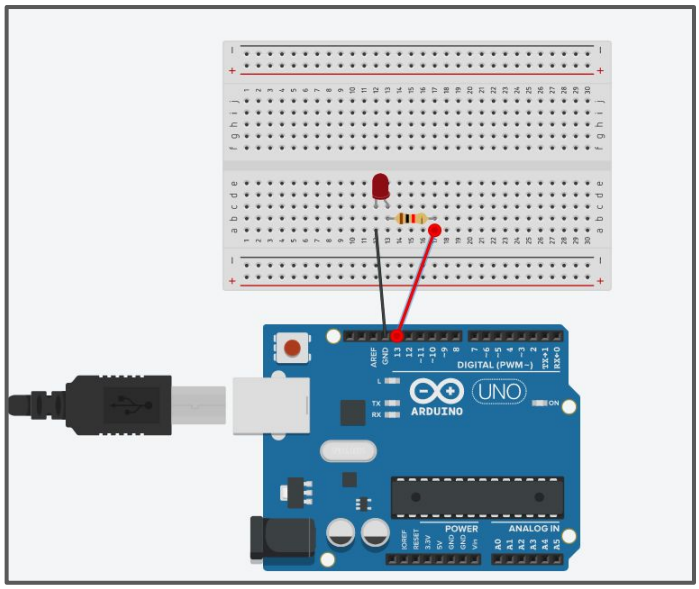
Build



*Side Note
When using the Arduino Software, instead of it specifically stating pin 13 in the code, it will use LED_Builtin. It states in the comments at the top of the program that LED_Builtin and pin 13 are one in the same.



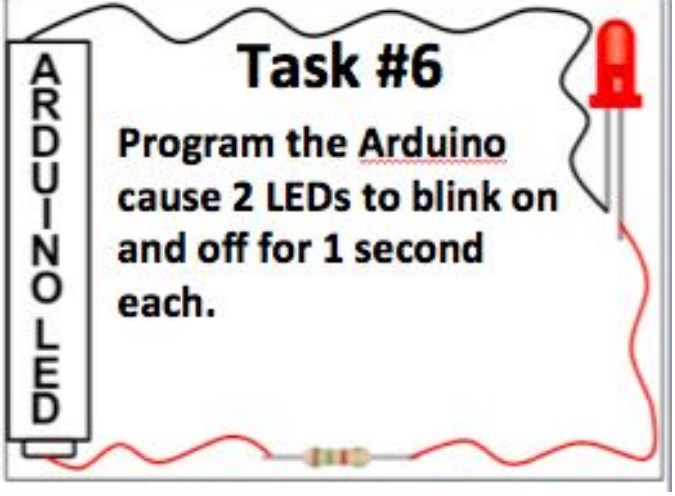
Build



Code

```
void setup()
{
  pinMode(13, OUTPUT);
}

void loop()
{
  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(2000);

  digitalWrite(13, HIGH);
  delay(1000);
  digitalWrite(13, LOW);
  delay(1000);

  digitalWrite(13, HIGH);
  delay(1000);
  digitalWrite(13, LOW);
  delay(1000);

  digitalWrite(13, HIGH);
  delay(1000);
  digitalWrite(13, LOW);
  delay(2000);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(500);

  digitalWrite(13, HIGH);
  delay(500);
  digitalWrite(13, LOW);
  delay(2000);
}
```

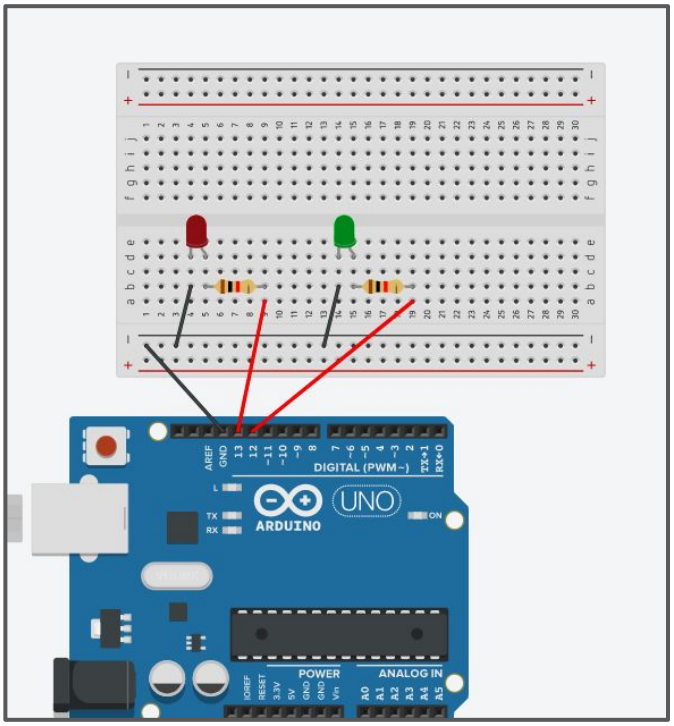
Teaching and Tech MAGIC

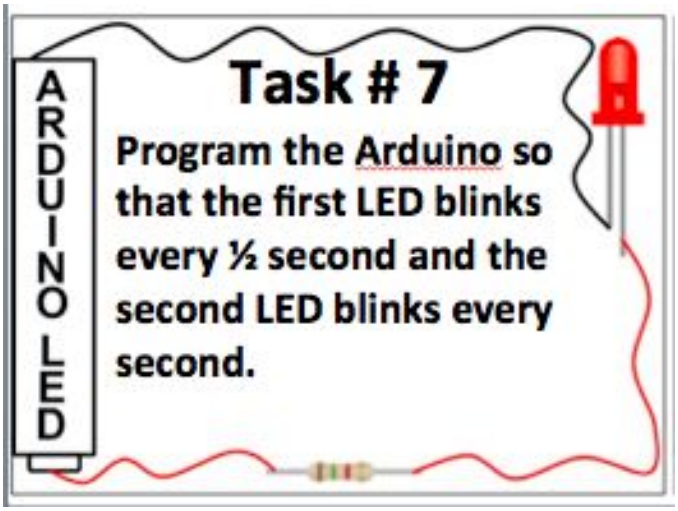


Code

```
int led = 13;
int led2 = 12;



void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);

}


void loop() {
  digitalWrite(led, HIGH);
  delay(1000);
  digitalWrite(led, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);

}
```

Build

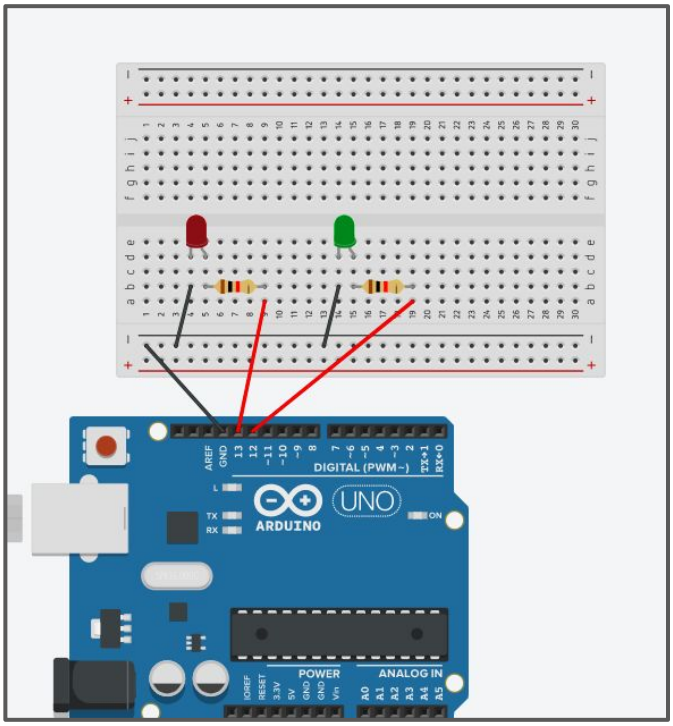


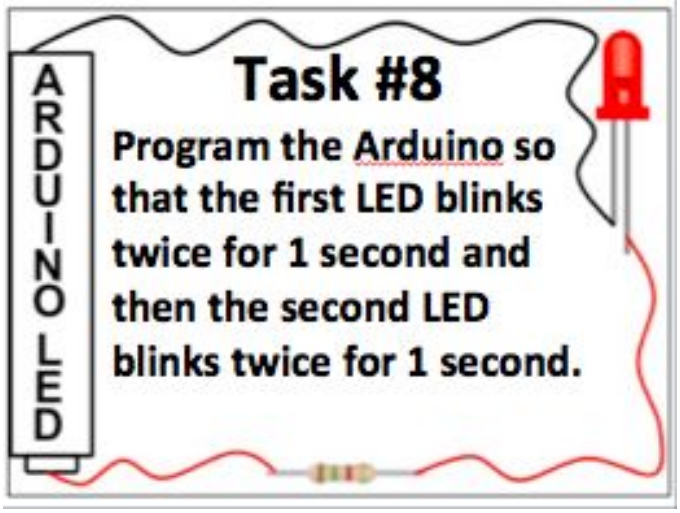


Code

```
int led = 13;
int led2 = 12;



void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);

}


void loop() {
  digitalWrite(led2, HIGH);
  delay(1000);

  digitalWrite(led, HIGH);
  delay(500);
  digitalWrite(led, LOW);
  delay(500);

  digitalWrite(led, HIGH);
  delay(500);
  digitalWrite(led, LOW);
  delay(500);

  digitalWrite(led2, LOW);
  delay(1000);

}
```

Build

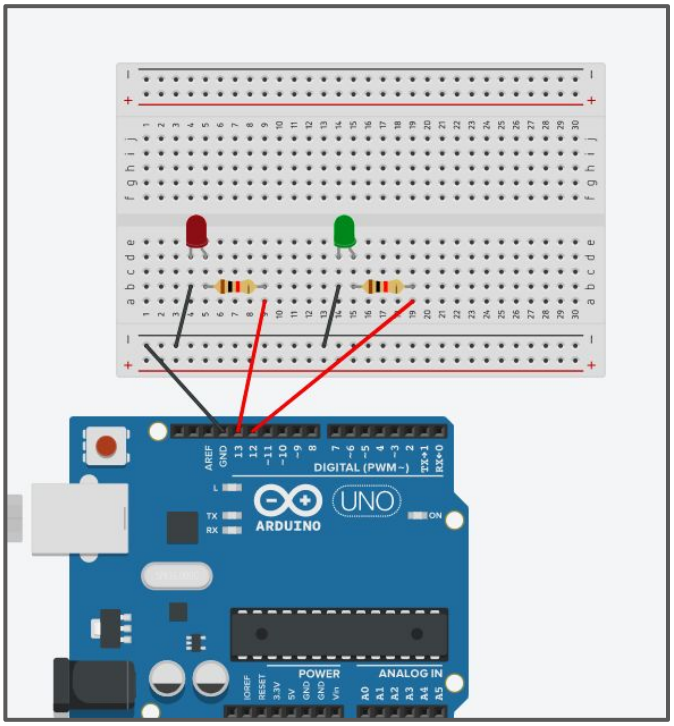


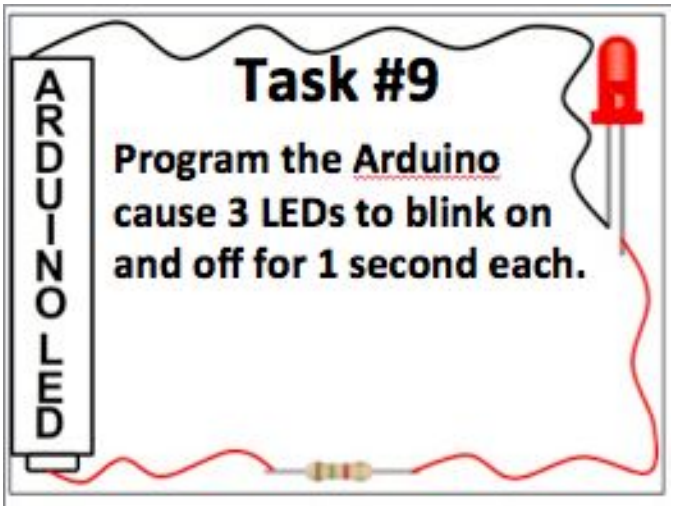


Code

```
int led = 13;
int led2 = 12;



void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);

}


void loop() {
  digitalWrite(led, HIGH);
  delay(1000);
  digitalWrite(led, LOW);
  delay(1000);

  digitalWrite(led, HIGH);
  delay(1000);
  digitalWrite(led, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);

}
```

Build

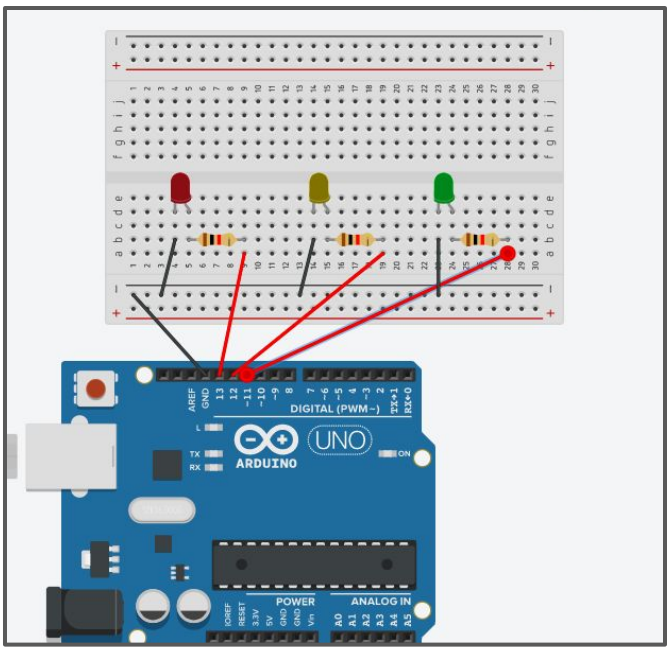


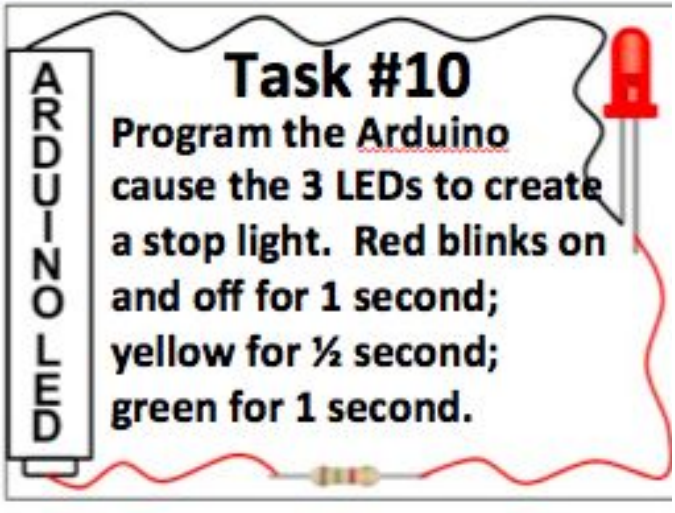


Code

```
int led = 13;
int led2 = 12;
int led3 = 11;


void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
}


void loop() {
  digitalWrite(led, HIGH);
  delay(1000);
  digitalWrite(led, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);

  digitalWrite(led3, HIGH);
  delay(1000);
  digitalWrite(led3, LOW);
  delay(1000);
}
```

Build

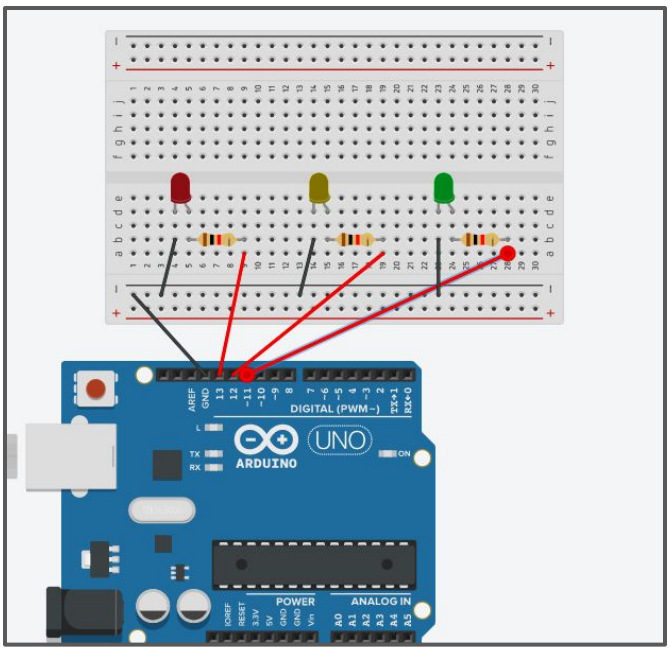


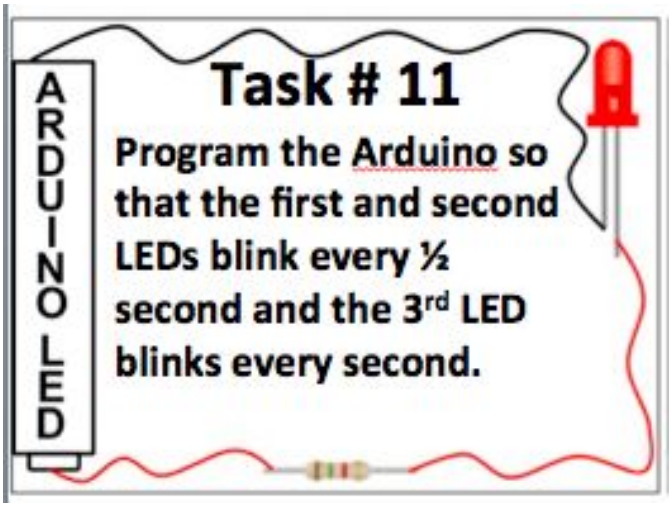


Code

```
int led = 13;
int led2 = 12;
int led3 = 11;


void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);
  pinMode(led3, OUTPUT);
}


void loop() {
  digitalWrite(led, HIGH);
  delay(1000);
  digitalWrite(led, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(500);
  digitalWrite(led2, LOW);
  delay(500);

  digitalWrite(led3, HIGH);
  delay(1000);
  digitalWrite(led3, LOW);
  delay(1000);
}
```

Build

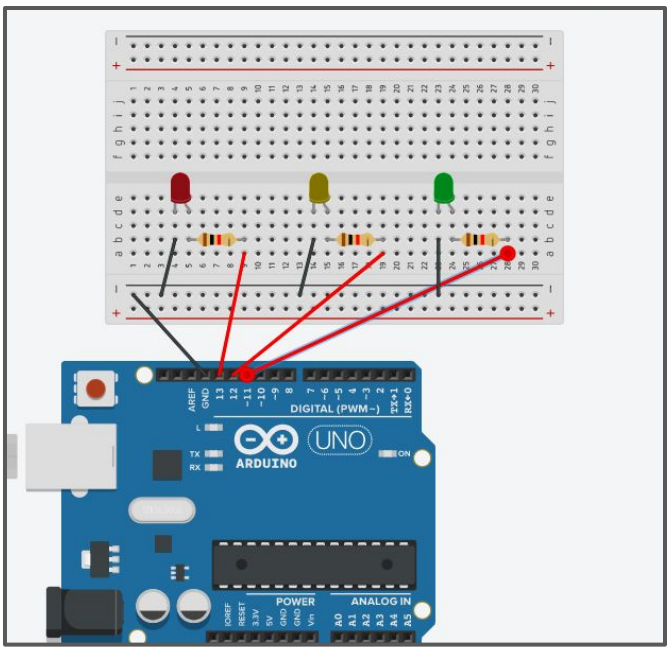




Code

```
int led = 13;
int led2 = 12;
int led3 = 11;

void setup() {

 pinMode(led, OUTPUT);
 pinMode(led2, OUTPUT);
 pinMode(led3,OUTPUT);

}

void loop() {
 digitalWrite(led3, HIGH);
 delay(1000);

 digitalWrite(led, HIGH);
 delay(500);
 digitalWrite(led2, HIGH);
 delay(500);

 digitalWrite(led, LOW);
 delay(500);
 digitalWrite(led2, LOW);
 delay(500);

 digitalWrite(led, HIGH);
 delay(500);
 digitalWrite(led2, HIGH);
 delay(500);
```

Build



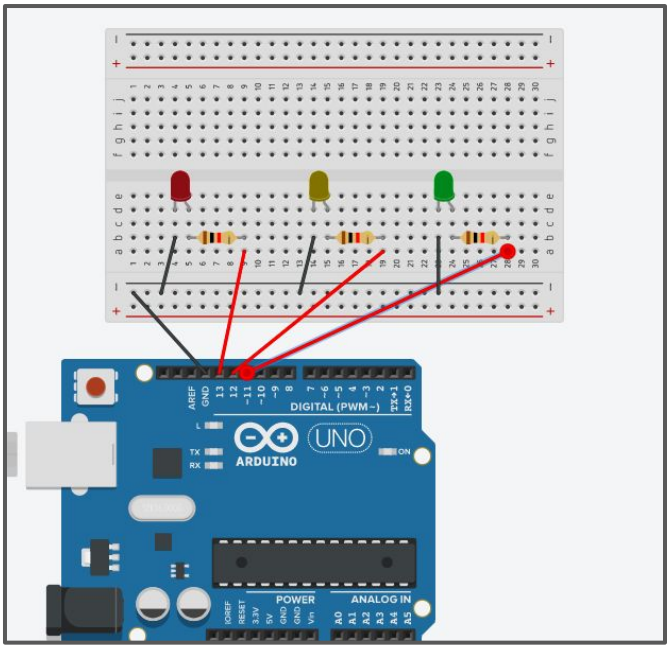

```
 digitalWrite(led, LOW);
 delay(500);
 digitalWrite(led2, LOW);
 delay(500);

 digitalWrite(led3, LOW);
 delay(1000);

}
```

ARDUINO LED

Task #12

Program the Arduino to cause the 3 LEDs to blink out SOS in Morse Code. Each LED will have it's own letter. Use ½ second for the dots and 1 second for the dashes. . . . - - - . . .

Build



Code

```
int led = 13;
int led2 = 12;
int led3 = 11;

void setup() {

  pinMode(led, OUTPUT);
  pinMode(led2, OUTPUT);
pinMode(led3, OUTPUT);
}

void loop()
{
  digitalWrite(led, HIGH);
  delay(500);
  digitalWrite(led, LOW);
  delay(500);

  digitalWrite(led, HIGH);
  delay(500);
  digitalWrite(led, LOW);
  delay(500);

  digitalWrite(led, HIGH);
  delay(500);
  digitalWrite(led, LOW);
  delay(2000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);
```

```
  digitalWrite(led2 HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(1000);

  digitalWrite(led2, HIGH);
  delay(1000);
  digitalWrite(led2, LOW);
  delay(2000);

  digitalWrite(led3, HIGH);
  delay(500);
  digitalWrite(led3, LOW);
  delay(500);

  digitalWrite(led3, HIGH);
  delay(500);
  digitalWrite(led3, LOW);
  delay(500);

  digitalWrite(led3, HIGH);
  delay(500);
  digitalWrite(led3, LOW);
  delay(2000);
}
```

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