

كل ما يحتاجه الطالب في جميع الصفوف من أوراق عمل واختبارات ومذكرات، يجده هنا في الروابط التالية لأفضل مواقع تعليمي إماراتي 100 %

<u>تطبيق المناهج الإماراتية</u>	<u>الاجتماعيات</u>	<u>الرياضيات</u>
<u>الصفحة الرسمية على التلغرام</u>	<u>الاسلامية</u>	<u>العلوم</u>
<u>الصفحة الرسمية على الفيسبوك</u>	<u>الانجليزية</u>	
<u>التربية الاخلاقية لجميع الصفوف</u>	<u>اللغة العربية</u>	
<u>التربية الرياضية</u>		
<b>مجموعات التلغرام.</b>	<b>مجموعات الفيسبوك</b>	<b>قنوات تلغرام</b>
<u>الصف الأول</u>	<u>الصف الأول</u>	<u>الصف الأول</u>
<u>الصف الثاني</u>	<u>الصف الثاني</u>	<u>الصف الثاني</u>
<u>الصف الثالث</u>	<u>الصف الثالث</u>	<u>الصف الثالث</u>
<u>الصف الرابع</u>	<u>الصف الرابع</u>	<u>الصف الرابع</u>
<u>الصف الخامس</u>	<u>الصف الخامس</u>	<u>الصف الخامس</u>
<u>الصف السادس</u>	<u>الصف السادس</u>	<u>الصف السادس</u>
<u>الصف السابع</u>	<u>الصف السابع</u>	<u>الصف السابع</u>
<u>الصف الثامن</u>	<u>الصف الثامن</u>	<u>الصف الثامن</u>
<u>الصف التاسع عام</u>	<u>الصف التاسع عام</u>	<u>الصف التاسع عام</u>
<u>الصف التاسع متقدم</u>	<u>الصف التاسع متقدم</u>	<u>الصف التاسع متقدم</u>
<u>الصف العاشر عام</u>	<u>الصف العاشر عام</u>	<u>الصف العاشر عام</u>
<u>الصف العاشر متقدم</u>	<u>الصف العاشر متقدم</u>	<u>الصف العاشر متقدم</u>
<u>الحادي عشر عام</u>	<u>الحادي عشر عام</u>	<u>الحادي عشر عام</u>
<u>الحادي عشر متقدم</u>	<u>الحادي عشر متقدم</u>	<u>الحادي عشر متقدم</u>
<u>ثاني عشر عام</u>	<u>الثاني عشر عام</u>	<u>الثاني عشر عام</u>
<u>ثاني عشر متقدم</u>	<u>الثاني عشر متقدم</u>	<u>الثاني عشر متقدم</u>



# CDI Assessment – Practical Summative Assessment Task (PSA) Support PowerPoint

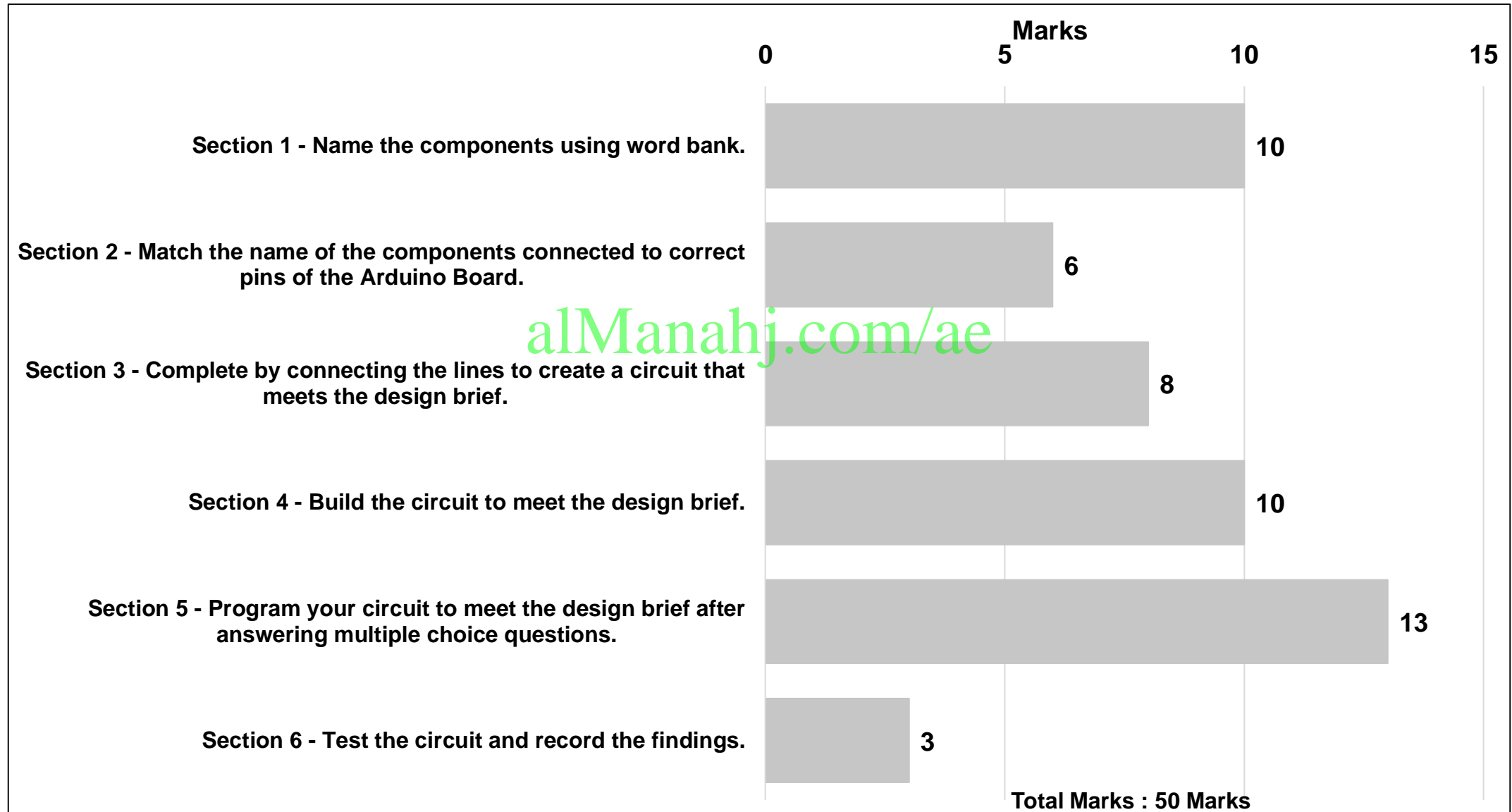
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Term 3 (2018-2019)  
Grade – 12 (General)

ADU – Assessment Development Unit



## Graphical Mark Breakdown of PSA task





## Book Content Guidance

Topic			Page
Chapter	Section	Content	Book reference
2	3	Working principle of the circuit	127 - 146

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- Blue Pen, Pencil and Ruler
- Robotic Arm Kit
- Tesla Kit
- Laptop / Computer
- Arduino IDE software





## Electronic Components

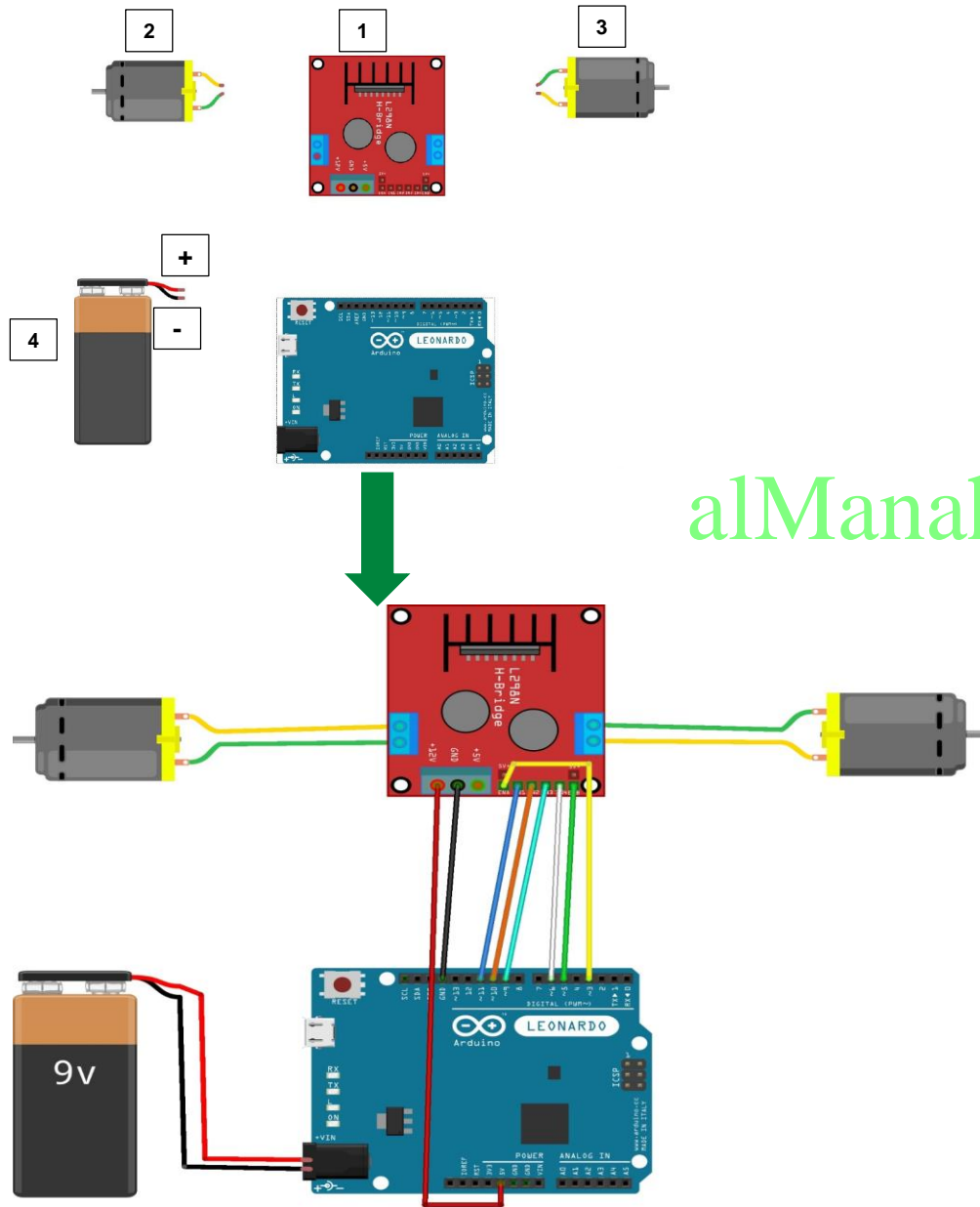
	Component	Schematic Symbol	Component picture
1.	Battery		
2.	Resistor		
3.	Diode		
4.	LED		
5.	Capacitor		
6.	Transistor		
7.	Potentiometer		
9.	DC Motor		

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# Creating a circuit diagram on Paper



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Pin Connection Table		
Component No.	Connected to	
1	Pin 7 (enable Pin)	D3 of Arduino
	Pin 8	D11 of Arduino
	Pin 9	D10 of Arduino
	Pin 10	D9 of Arduino
	Pin 11	D6 of Arduino
	Pin 12 (enable pin)	D5 of Arduino
	Pin 3	5V of Arduino
2	Pin 5	GND of Arduino
	Pin 1 of component 1	
3	Pin 2 of Component 1	
	Pin 13 of component 1	
4	Pin 14 of Component 1	
	+	Power Jack
	-	





# Guidance and Checks For Building The Circuit

## To build a circuit:

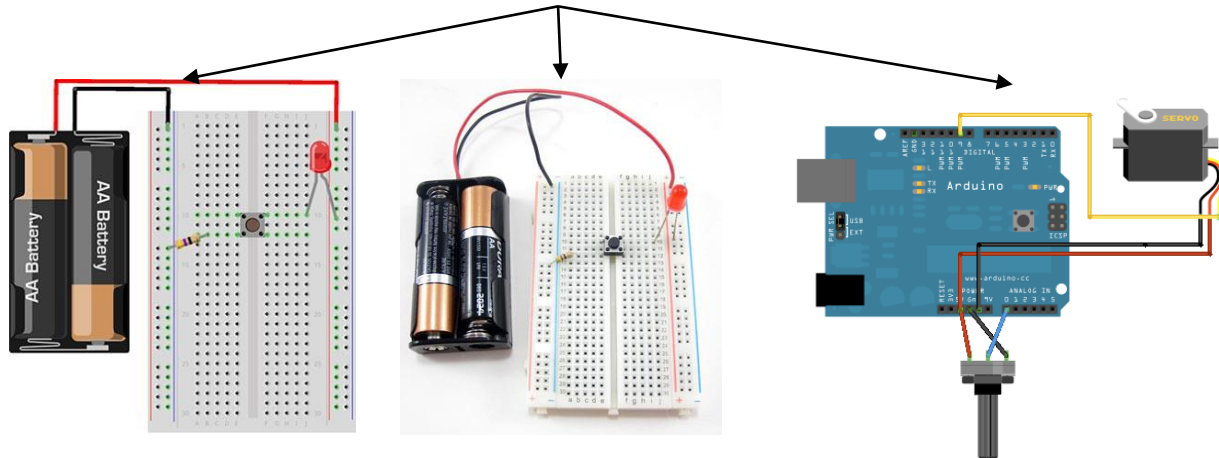
- Follow the breadboard diagram for the circuit, connecting one component at a time.
- Always connect the batteries or power supply to your circuit *last*. This will give you a chance to double-check all your connections before you turn your circuit on for the first time.
- Keep an eye out for common mistakes while building a circuit.

## Testing a circuit:

- Double-check your circuit and the breadboard diagram to make sure all your components are in the right place.
- Check what your circuit is supposed to do according to the design brief.
- Turn the power to your circuit on (for example, by sliding a battery pack switch from OFF to ON). If you see or smell smoke, turn off or disconnect the power supply *immediately*. This means you have a short circuit.
- Follow the project directions / design brief to use your circuit.
- If the circuit does not work, you need to troubleshoot (or **debug**, meaning to look for problems or "bugs" in your circuit).

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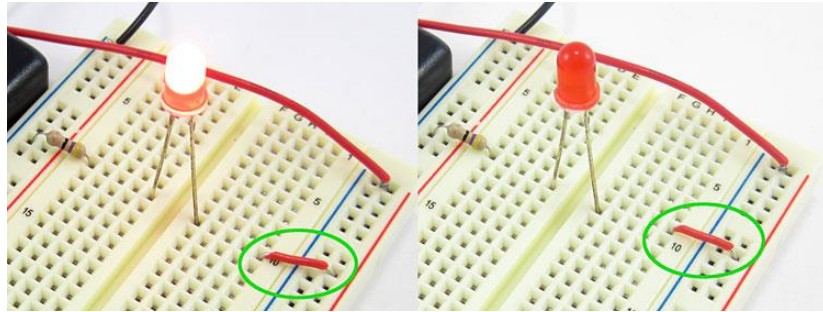
## Examples



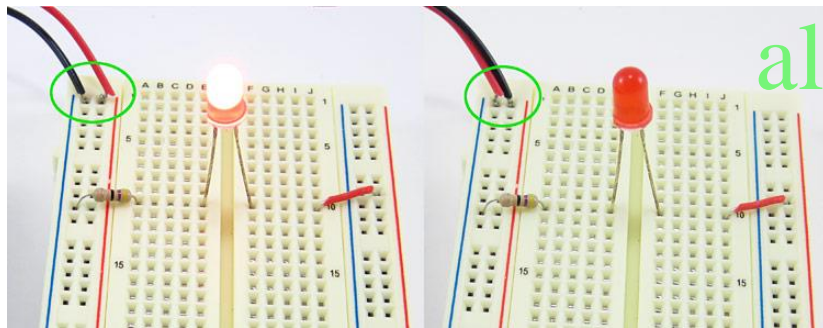




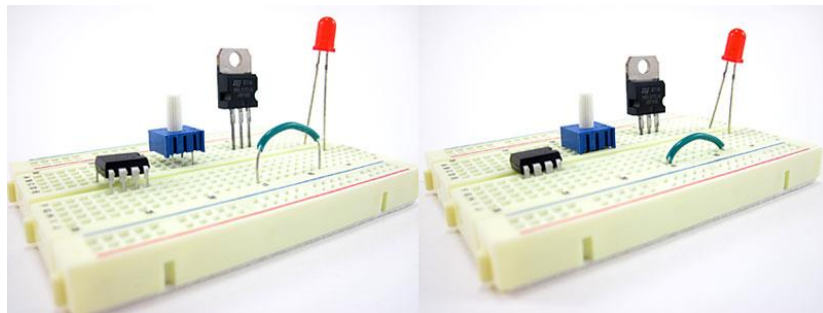
## Guidance and Checks For Building The Circuit



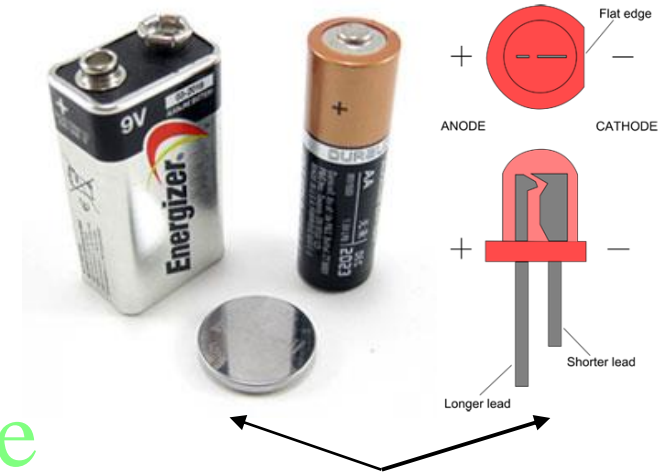
Getting row numbers wrong



Getting power and ground mixed up

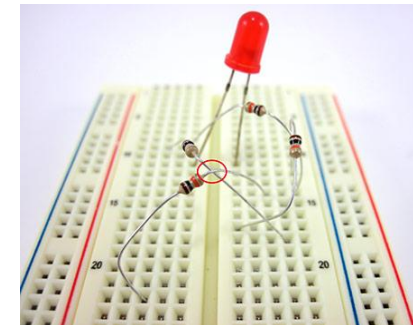


Not pushing leads and wires in all the way



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Some components have **polarity**, meaning they have a positive side and a negative side that must be connected correctly.



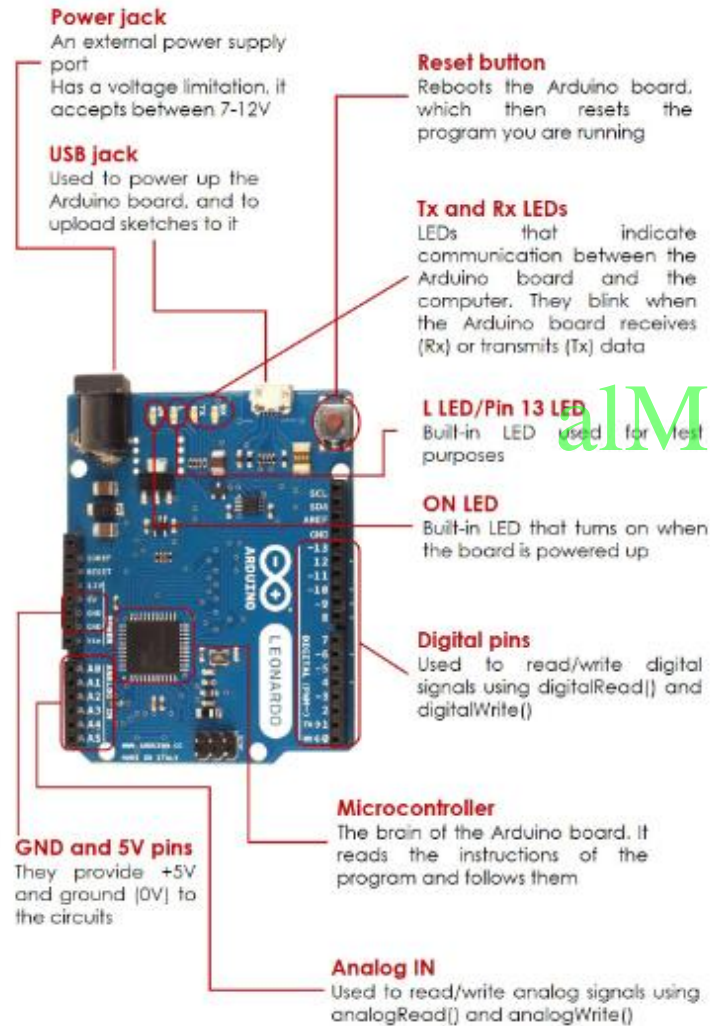
Short circuits



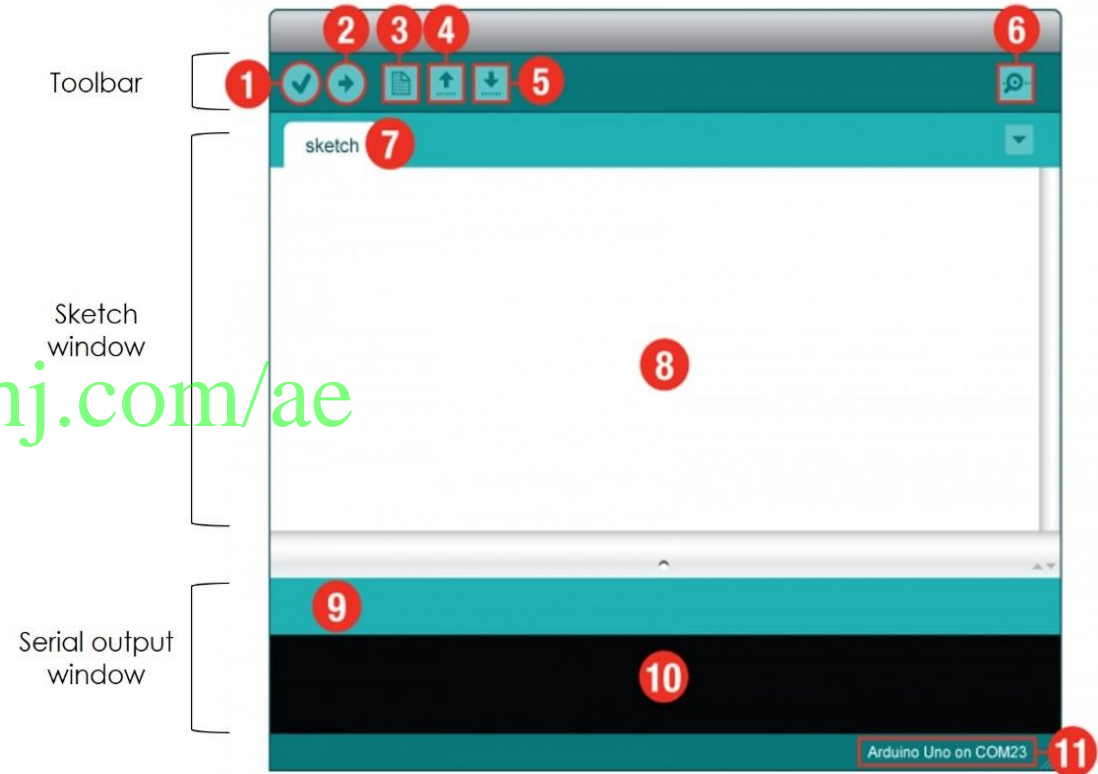




## Arduino Board



## Arduino IDE Interface





## Arduino Commonly Used Commands

Command	Description
<code>pinMode(pin_x,INPUT)</code>	initialize pin x as an INPUT(defined only once --> written in the setup()function)
<code>pinMode(pin_x,OUTPUT)</code>	initialize pin x as an OUTPUT (defined only once --> written in the setup() function)
<b>Note:</b> pinMode is only used with digital components digital I/O pins: 2-13	
<code>digitalRead(x,HIGH)</code>	set pin x to 5V
<code>digitalWrite(x,HIGH)</code>	set pin x to 0V
<code>analogRead(pin_x)</code>	read a value from the analog input pin x
<code>analogWrite(pin_x, dutyCycle)</code>	generate a PWM signal, where the duty cycle value is between 0-255
<b>Note:</b> analog pins: A0-A5	
<code>delay(ms)</code>	time to wait in milliseconds
<code>Serial.println(x)</code>	print the value x on the serial monitor (x could be any data type)
<code>map(value, fromLow, fromHigh, toLow, toHigh);</code>	map a value within a range to one within another range





# Programming Tips

**SIGNALS**  
A physical quantity that represents information



## **DIGITAL**

A signal with patterns of bits 0 or 1

**Electronic Component Used:**

**PUSH BUTTON**

## **ANALOG**

A signal with infinite numbers.

Arduino can digitizes analog signals (1024 levels)

The level values are from 0 – 1023

Electronic Component Used: **POTENTIOMETER**



Statement to Initialize  
Arduino pins for  
INPUT or OUTPUT



**Format:** `pinMode(pin#, MODE);`

**Example:** `pinMode(7,INPUT);`  
`pinMode(7,OUTPUT);`



DIGITAL READ AND WRITE

ANALOG READ AND WRITE

## **Read the Digital Signal**

**Format:** `digitalRead(pin#);`

**Example:** `digitalRead(7);`

## **Write the Digital Signal**

**Format:** `digitalWrite(pin#,value);`

**Value** → HIGH or LOW

**Example:** `digitalWrite(7,HIGH);`

## **Read the Analog Signal**

**Format:** `analogRead(pin#);`

**Example:** `analogRead(7);`

## **Write the Analog Signal**

**Format:** `analogWrite(pin#,value);`

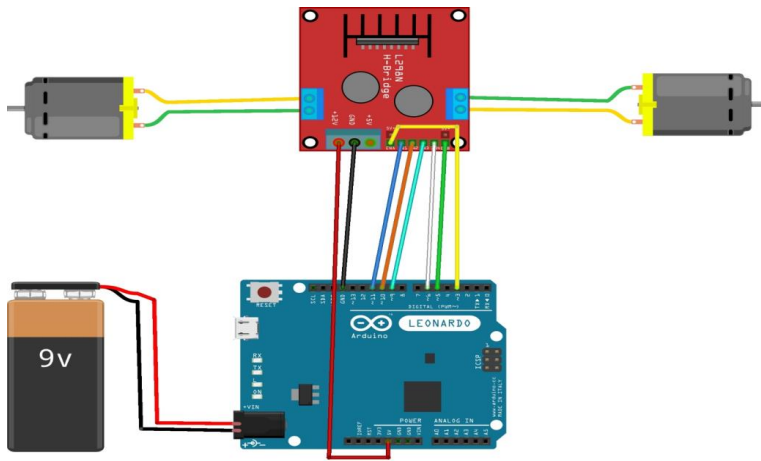
**Value** → Between 0 to 255

**Example:** `analogWrite(7,127);`



## Example of a program

Edit the given code to rotate the dc motors in opposite direction.  
The hardware connection is shown below.



∞ Grade\_12\_example | Arduino 1.8.9

File Edit Sketch Tools Help



Grade\_12\_example

```
//speed of motors between 0 and 255|
```

```
int pwm_speedA = 255;
```

```
int pwm_speedB = 240;
```

```
void setup() {
```

```
  Serial1.begin(9600);
```

```
  //pins for motor controller
```

```
  ;
```

```
  ;
```

```
  ;
```

```
  ;
```

```
  ;
```

```
  ;
```

```
  ;
```

```
}
```

```
void loop() {
```

```
  digitalWrite(10, LOW);
```

```
  digitalWrite(11, HIGH);
```

```
  ;
```

```
  digitalWrite(9, LOW);
```

```
  digitalWrite(6, HIGH);
```

```
  ;
```

```
}
```

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## Example of a program

Grade\_12\_example | Arduino 1.8.9

File Edit Sketch Tools Help



Grade\_12\_example

```
//speed of motors between 0 and 255
```

```
int pwm_speedA = 255;
```

```
int pwm_speedB = 240;
```

```
void setup() {
```

```
  Serial1.begin(9600);
```

```
  //pins for motor controller
```

```
  pinMode(11, OUTPUT) ;
```

```
  pinMode(10, OUTPUT) ;
```

```
  pinMode(9, OUTPUT) ;
```

```
  pinMode(6, OUTPUT) ;
```

```
  pinMode(5, OUTPUT) ;
```

```
  pinMode(3, OUTPUT) ;
```

```
}
```

```
void loop() {
```

```
  digitalWrite(10, LOW);
```

```
  digitalWrite(11, HIGH);
```

```
  analogWrite(3, pwm_speedB);
```

```
  digitalWrite(9, LOW);
```

```
  digitalWrite(6, HIGH);
```

```
  analogWrite(5, pwm_speedA);
```

```
}
```

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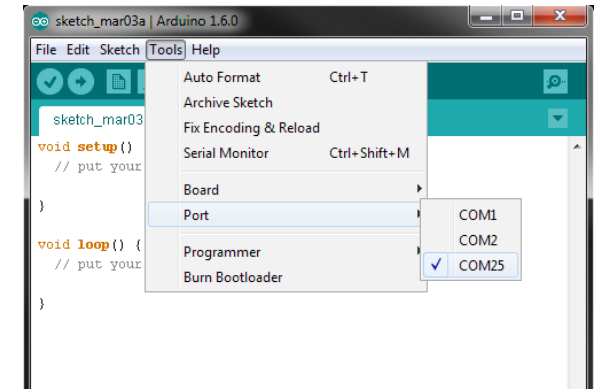


# How to run a program?

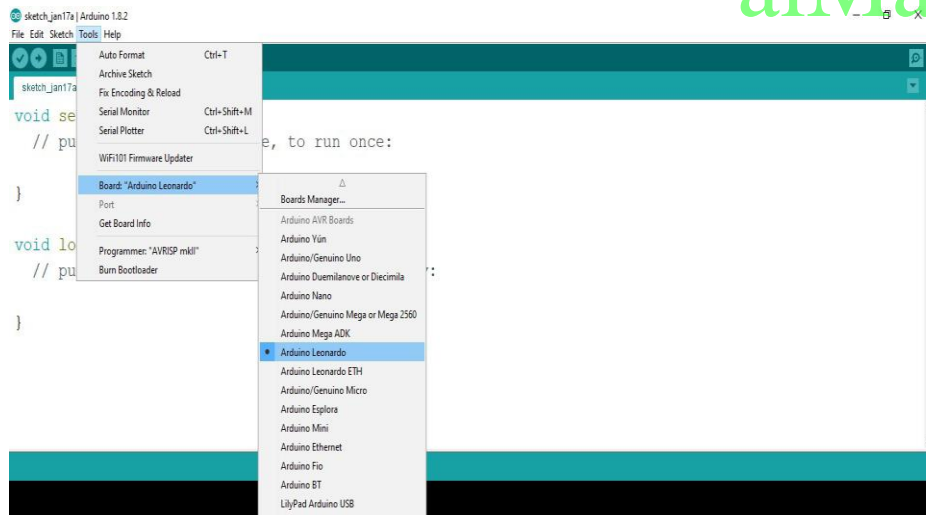


**Step 1 – Connect your laptop to Arduino Board**

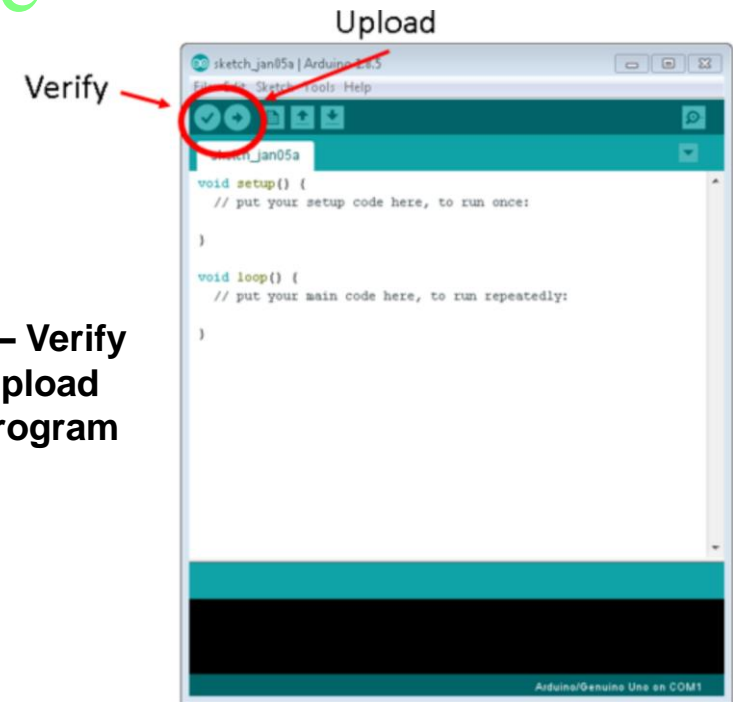
**Step 3 – Selecting Port**



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**Step 2 – Select your Arduino Board**



**Step 4 – Verify and Upload your program**

