



# قسم الانظمة الطبية الذكية

## Description of the Arduino Device

المرحلة الثالثة

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# What is Arduino?

**Arduino:** is a single board microcontroller based on a single Integrated Circuit chip.

- There are variety of them, but we will concentrate on the Arduino Uno.
- The Arduino's are open-source software open-source hardware.
- They are widely used for education and hobbyists due to low cost and availability.

# Popular Arduino Board Models



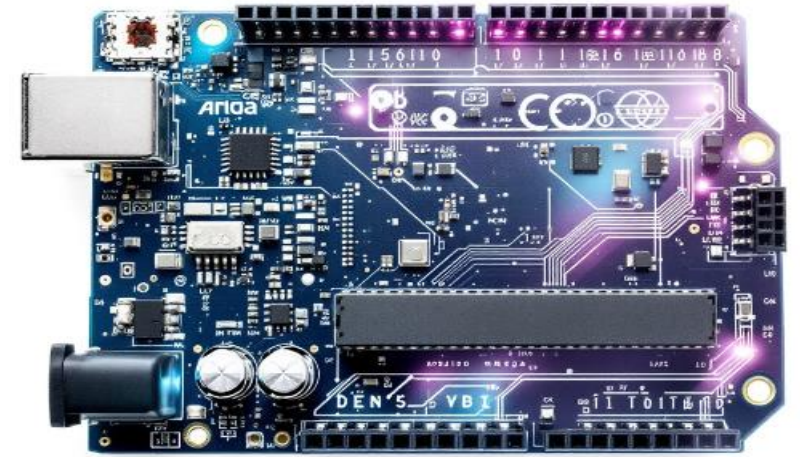
**Arduino Uno**

The classic board and most popular model, perfect for beginners. Features 14 digital I/O pins, 6 analog inputs, and operates at 5V with a 16MHz clock. Its well-documented design makes it ideal for learning the basics.



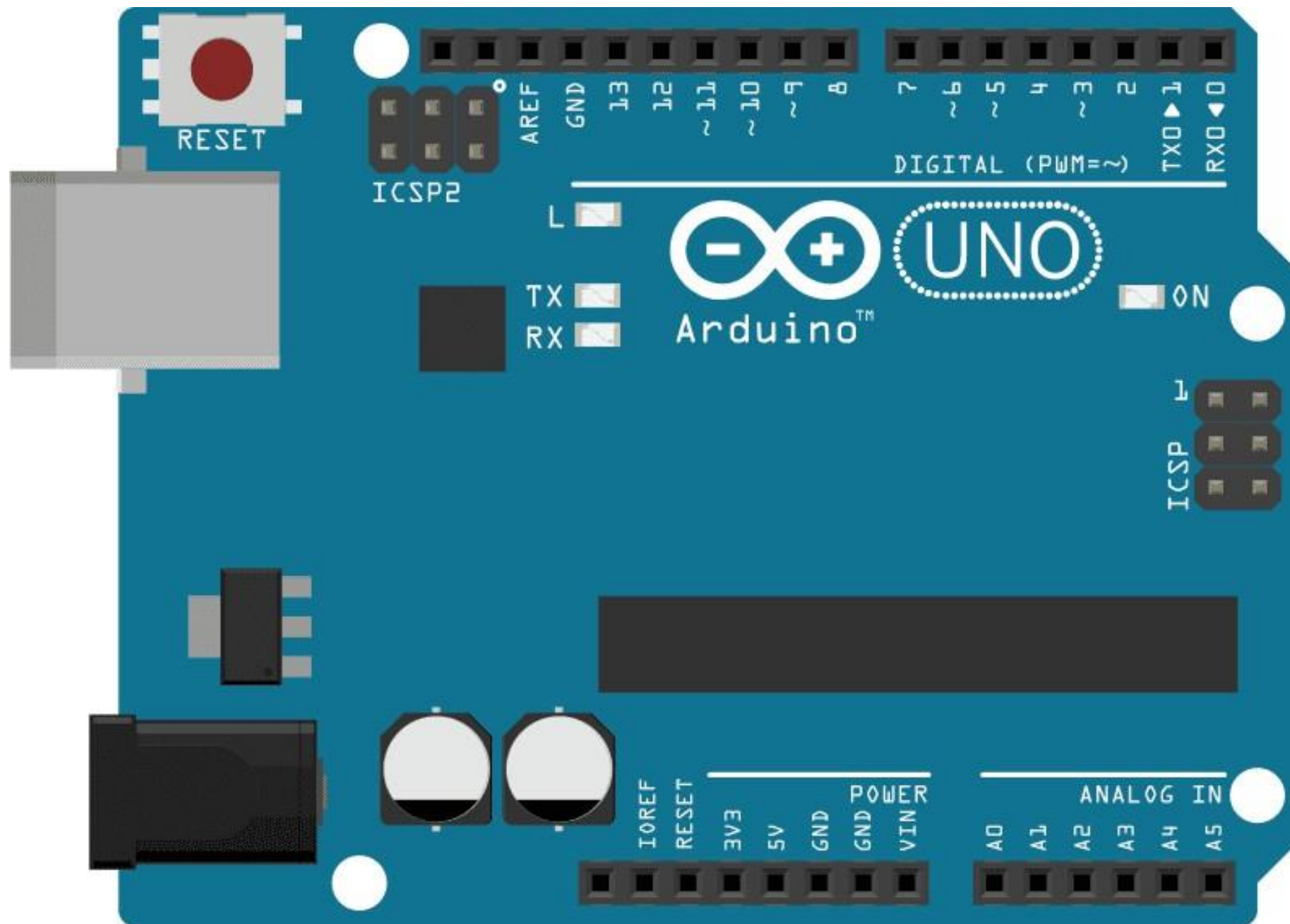
**Arduino Nano**

A compact version of the Uno with similar capabilities in a much smaller form factor. Perfect for space-constrained projects and wearable electronics. Its breadboard-friendly design makes prototyping easy.

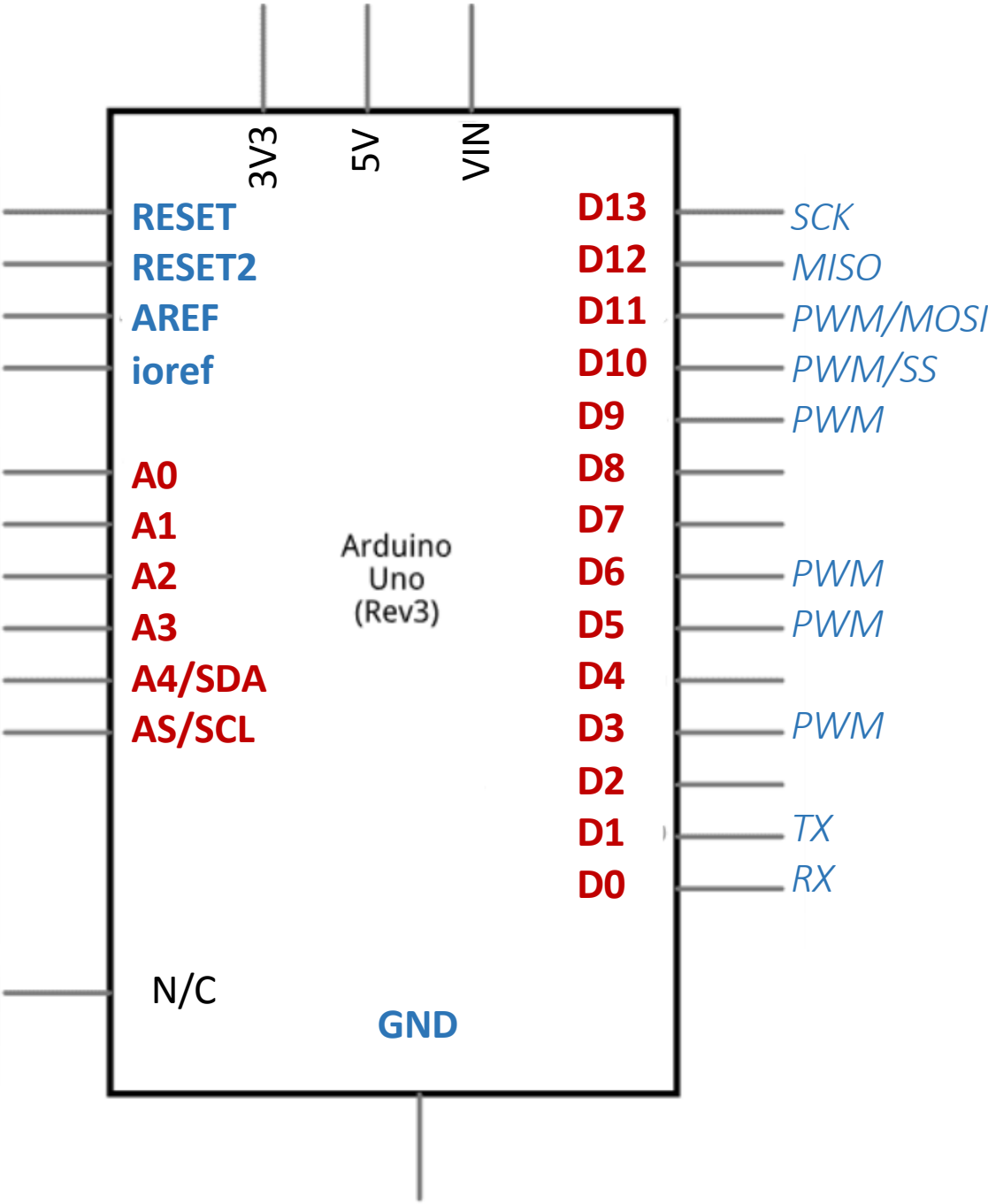


**Arduino Mega**

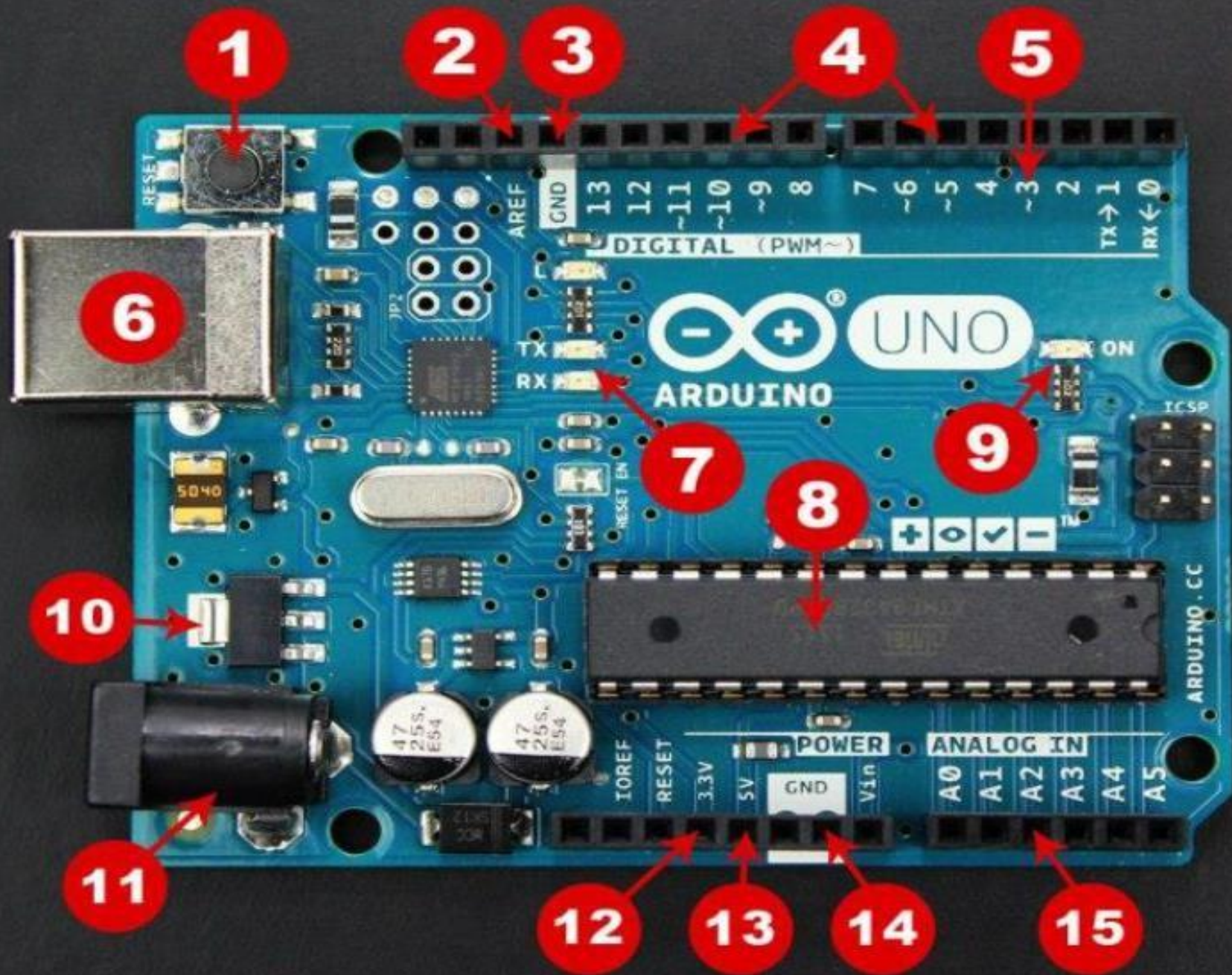
A more powerful board with 54 digital I/O pins and 16 analog inputs. Ideal for complex projects requiring many inputs, outputs, or multiple serial communications. Often used in 3D



# Arduino Uno Schematic Pin Diagram









1. **Reset Button** – This will restart any code that is loaded to the Arduino board
2. **AREF** – Stands for “Analog Reference” and is used to set an external reference voltage
3. **Ground Pin** – There are a few ground pins on the Arduino and they all work the same
4. **Digital Input/Output** – Pins 0-13 can be used for digital input or output
5. **PWM** – The pins marked with the (~) symbol can simulate analog output
6. **USB Connection** – Used for powering up your Arduino and uploading sketches
7. **TX/RX** – Transmit and receive data indication LEDs
8. **ATmega Microcontroller** – This is the brains and is where the programs are stored
9. **Power LED Indicator** – This LED lights up anytime the board is plugged in a power source
10. **Voltage Regulator** – This controls the amount of voltage going into the Arduino board
11. **DC Power Barrel Jack** – This is used for powering your Arduino with a power supply
12. **3.3V Pin** – This pin supplies 3.3 volts of power to your projects
13. **5V Pin** – This pin supplies 5 volts of power to your projects
14. **Ground Pins** – There are a few ground pins on the Arduino and they all work the same
15. **Analog Pins** – These pins can read the signal from an analog sensor and convert it to digital

# Static Charge

**Electronic components are sensitive to static charges and needs to be handled carefully otherwise could be damaged. Discharging of tactile surfaces that are going to be in physical contact with these components is a must for the safety and prevention of damage. For these reasons we find that electronic components are usually supplied in static envelops (pouches).**



# Common Arduino Applications

## 1. Home Automation

Smart lighting, automated blinds, security systems, and environmental monitoring. Arduino's ability to interface with various sensors makes it perfect for DIY smart home solutions.

## 2. Robotics

Motor control, navigation systems, sensor integration, and autonomous behaviors. Arduino provides an affordable entry point into building everything from simple wheeled robots to complex robotic arms.

## 3. Environmental Monitoring

Weather stations, plant monitoring systems, and air quality sensors. Arduino's analog input capabilities make it ideal for collecting and logging environmental data.

# Getting Started with Arduino



Purchase Your First Board



Install the Software



Connect Your Hardware



Upload Your First Sketch

# Arduino downloads

The response will be something like this:

<https://www.arduino.cc> › software ⋮

## Software | Arduino

Apr 8, 2021 — **Downloads.** **Arduino** IDE 1.8.16. The open-source **Arduino** Software (IDE) makes it easy ...

[OldSoftwareReleases](#) · [Donate](#) · [Arduino IDE 2.0 beta \(2021\)](#) · [Getting Started](#)

# Click on the link:



## Arduino IDE 1.8.16

The open-source Arduino Software (IDE) makes it easy to write code and upload it to the board. This software can be used with any Arduino board.

Refer to the [Getting Started](#) page for Installation instructions.

### SOURCE CODE

Active development of the Arduino software is [hosted by GitHub](#). See the instructions for [building the code](#). Latest release source code archives are available [here](#). The archives are PGP-signed so they can be verified using [this](#) gpg key.

Wind

### DOWNLOAD OPTIONS

**Windows** Win 7 and newer

**Windows** ZIP file

**Windows app** Win 8.1 or 10



**Linux** 32 bits

**Linux** 64 bits

**Linux** ARM 32 bits

**Linux** ARM 64 bits

**Mac OS X** 10.10 or newer

[Release Notes](#) [Checksums \(sha512\)](#)



Thank You