

Vocabulary List

Alligator Clip: A spring-loaded clip used to make temporary electrical connections for prototype circuits. Also called a crocodile clip.

Analog: A signal that can vary continuously within a range, used to measure things like light or sound in real-world values.

Arduino: An open-source electronics platform used for building interactive projects, combining hardware and software.

Breadboard: A tool used to build and test circuits without soldering, making it easy to rearrange components.

Conditionals: Programming logic that allows a system to take different actions based on whether specific conditions are met.

Conductive: A material that allows electricity to flow through it, such as conductive fabrics or threads used in e-textiles.

Current: The flow of electric charge through a circuit, measured in amperes (A).

Digital: A signal that only has two states, on or off, often represented by 0 or 1 in electronics.

Electronic Textiles: Textiles that incorporate conductive materials, such as threads or fabrics, to enable electrical connections within the material itself. These textiles can integrate components like sensors, LEDs, and microcontrollers (such as Arduino) to create interactive garments or objects that respond to inputs like pressure, touch, or movement. E-textiles blend traditional textile design with electronics, allowing for soft, flexible, and/or wearable circuits.

→ A more expansive definition might include rethinking how we approach fibers and textiles broadly when electricity is considered a material property and emerging technologies expand our toolkits. Note that there is an entirely new set of considerations in merging textiles and electronics. Common themes might include: Embedding vs enclosing / Transparency vs opaque / Narrative & aesthetics vs efficiency & functionality

Functions: Reusable blocks of code in programming that perform specific tasks or operations. Arduino already has multiple functions that have been created for us like `digitalWrite(pin, HIGH/LOW)`; We can also create our own functions.

Input: Data or signals that enter a system, such as pressing a button or activating a sensor.

Insulating: A material that resists the flow of electric current, used to prevent unwanted electrical contact.

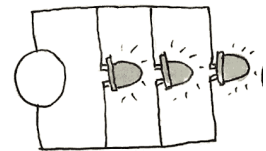
Jumper Wire: A wire used to connect different parts of a circuit, often in breadboards or Arduino projects.

Multimeter: A tool used to measure electrical properties like voltage, current, and resistance in circuits.

Open Source: Software or hardware whose design is publicly available for anyone to use, modify, and distribute.

Output: Signals or actions produced by a system, like turning on an LED or sending a message. In a circuit, these control output in the physical world. Also called actuators

Parallel Circuit: A type of circuit where components are connected in multiple paths, allowing current to flow through more than one route.



Pull Down Resistor: A resistor used to ensure a circuit reads a LOW (0) state when no input is present. Using pull down resistor ensures it is in a high or low state so the Arduino can read it. You can use these with every switch and they will be 10K Ohms (brown, black, orange).

Pull Up Resistor: A resistor used to ensure a circuit reads a HIGH (1) state when no input is present. Arduino has pull up resistors that we can activate with `pinMode(INPUT_PULLUP, pinNumber)` instead of INPUT. This means we do not need a pull down resistor.

Note: Pull up resistors are attached to power, not ground. This changes the logic of the LEDs from normally on to normally off so you will need to write a conditional to reverse that OR remember to write the opposite (i.e. write the LEDs HIGH when the button is pressed).

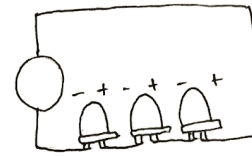
Pulse Width Modulation (PWM): A technique used to control power delivered to devices by rapidly switching the signal on and off.

Resistance: The opposition to the flow of electric current, measured in ohms (Ω), which determines how much current flows in a circuit.

Resistive: A material that limits the flow of electric current, often used in sensors to control circuit behavior.

Sensor: A device that detects changes in the environment, such as light or pressure, and sends signals based on those changes.

Series Circuit: A type of circuit where components are connected in a single path, so the same current flows through all parts.



Short Circuit: An unintended path in a circuit that allows current to bypass components and go back into the power source, generally resulting in excess heat. You want to avoid this and should unplug from power immediately if you feel heat.

Solder: A metal used to permanently join electrical components by melting it to create a strong connection.

Switch: A switch is a break in a circuit. Since the circuit is not complete, no electricity can flow to the components.

Traces: The physical paths of conductive material that electricity moves along in a circuit.

Variable Resistor: A resistor whose resistance can be adjusted, allowing for control over the amount of current flowing through a circuit.

Variables: Named storage locations in programming that hold values which can be changed during program execution.

Voltage: The electrical potential difference between two points, which drives current through a circuit, measured in volts (V).

Voltage Dividers: A simple circuit used to reduce voltage by splitting it between two resistors, useful for creating sensor inputs.

- More: The sensors we construct measure changes in resistance, but Arduino is all digital. It cannot read changes in resistance, but it can read changes in voltage. You can divide the voltage by using 2 resistors. As the ratio between two resistors changes, the voltage you get in the between them changes. For more on voltage dividers, see KOBAKANT's [tutorial](#) or the Sparkfun [tutorial](#).