

**The digitalRead() function in Arduino seems straightforward, but what values can it return? How does that relate to the voltage levels on the pins?**

The digitalRead() function might appear simple, but it acts as a translator for your Arduino. The function interprets the voltage on a pin and returns a value that reflects its state.

The Arduino language is built upon binary logic, a system stripped down to become two fundamental states: 0 and 1. In the world of Arduino, these two states translate to voltage levels. A high voltage level signifies a logical HIGH(1), and a low voltage indicates a logical LOW(0).

When digitalRead(pinNumber), it essentially measures the voltage on that pin and returns a corresponding value. The digitalRead() function bridges the gap between your Arduino's voltage levels and its binary values, providing you with two crucial pieces of information: a 1 signifies a high voltage (logical HIGH), and a 0 indicates a low voltage (logical LOW).

**Explain the functionality of the RX and TX lights and how they can help you understand the serial communication between your Arduino and a computer.**


The blinking lights on your Arduino board might seem insignificant, but RX and TX act as visual indicators for serial communication, a fundamental method for your Arduino to exchange data with a computer.

The TX (Transmit) Light flickers whenever your Arduino is actively sending data serially to a connected device, typically your computer. Imagine it as a "talking" indicator. The blinking signifies the data stream being transmitted one bit at a time.


The RX (Receive) Light flickers when your Arduino is receiving data serially from another device. Think of it as a "listening" indicator. A blinking RX light means your Arduino is actively processing incoming data bits. By observing the RX and Tx lights, you gain valuable insights into the communication flow between your Arduino and the computer, acting as a simple diagnostic tool.

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**Which of the following statements about resistors in IoT devices is MOST accurate?**


- Resistors limit the amount of electricity flowing through a circuit.  (Resistors limit the electrical current following through the circuit to protect components from overloading)
- Resistors store electricity for later use by the device.
- Resistors completely block electricity in one direction.
- Resistors convert electricity into different voltages.

**When you touch a screen with capacitive touch sensing, what happens?**


- A camera detects the change in light where your finger touches.
- The screen completes an electrical circuit.
- The screen releases a small, safe electrical field that changes when touched.  (Your finger disrupts the electrical field; the change in the electrical field is the screen's detection of touch)
- Pressure from your finger physically pushes down on a sensor beneath the screen.

**Which of the following correctly describes the difference between outputs and inputs for this device?**


- Inputs are for power only, while outputs are for sending data to other devices.
- Inputs allow users to control device settings, and outputs are automatic actions the device takes.
- Inputs control how often the device takes measurements, and outputs are the actual measurements themselves.

- Inputs are what the device uses to sense the environment, and outputs are how it displays information.  ( IoT devices collect data from the surroundings (input) and use the data to do something (output))

**Which of the following statements about power and ground in IoT devices is MOST accurate?**

- Both power and ground wires carry electricity, but in opposite directions.
- The power wire carries a strong electrical current, while the ground wire carries a weak current.
- The power wire supplies electricity to the device, and the ground wire removes any extra electricity.  (Ground is a safety measure that provides a path for any excess electricity to flow away safely)
- The power turns the device on/off, and the ground wire is for data transmission.

**Which of these features is NOT typically found on a basic LED matrix?**

- Different colored lights
- Tiny lights arranged in a grid
- Dimmer switch to adjust brightness  (While LED matrix may have built-in brightness controls, the dimmer switch would be a separate component)
- Screen to control display