Modular Redstone Circuit with Arduino and Snap-On Connectors

Nick Gerasev, Nick Lin, Ezan Khan, Harrison Che

(Earned 1st Place of the Lutron Lighting Innovation Competition)

1 The Gang

From left to right: Nick, Nick, Harrison, and Ezan (in spirit).

2 Project Overview

This project brings **Minecraft redstone circuits to life** using an **Arduino**, basic electronics, and **snap-on wire connectors** to create a modular system. The components replicate Minecraft mechanics, including:

- **Redstone Torch**
- **Redstone Lamp**
- **Lever**

- **Piston (with Arduino-controlled Servo)**
- **Wooden Slab**

Each component connects using modular snap-on wire connectors, allowing easy assembly and reconfiguration—just like placing blocks in Minecraft!

3 How It Works

- The **lever** toggles the circuit on and off.
- The **redstone torch** provides continuous power when placed.
- The **redstone lamp** lights up when powered.
- The **piston** is controlled via an **Arduino and servo motor**, moving when the circuit is powered.
- **Snap-on wire connectors** allow modular and easy circuit assembly.

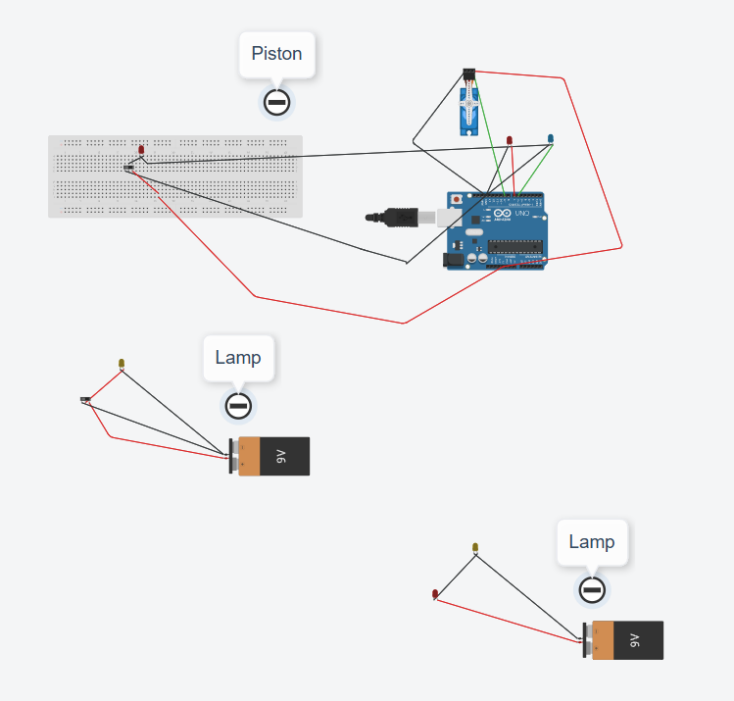
4 Hardware & Materials

- **Arduino (Uno/Nano/etc.)**
- **Servo Motor** (for piston movement)
- **LEDs** (for redstone torch & lamp)
- **Resistors**
- **Push Button / Toggle Switch** (for lever)
- **Wood/Plastic pieces** (for modular design)
- **Snap-on wire connectors**
- **Jumper Wires & Soldering Kit**

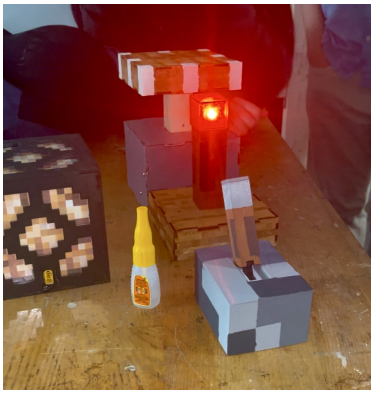
5 Code & Circuit Setup

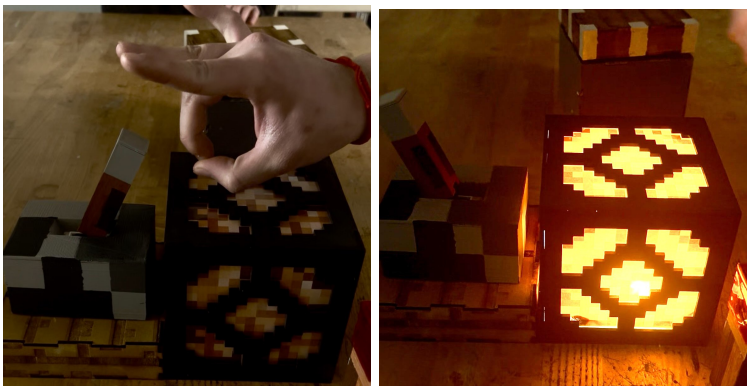
1. Upload the provided **Arduino sketch** to control the piston.
2. Connect the components according to the circuit diagram (see below).
3. Use snap-on connectors to assemble and test different redstone circuits.

6 Circuit Diagram



7 Project Images





8 Future Improvements

- Add more redstone components (e.g., **repeaters, comparators**)
- Improve modularity with **3D-printed casings**
- Integrate with a larger **Minecraft-inspired automation system**