

Pixie Escape Spell Game

Wizards Manual

Introduction

Three mischievous pixies have escaped their cage. You've been provided with a map of the room where they may be hiding, with possible locations marked by an RGB LED. As a wizard, you must use the included IR LED wand to guess a hiding location, then cast the spell "Wingardium Leviosa" to lift the obstacles and check whether you've caught a pixie. The map location will turn green to indicate a caught pixie, or red to indicate a miss. Once you have caught all three pixies, the map will sparkle to indicate you've won!

Contents

- Circuit Boards
- Arduino Uno
- Arduino to USB Cord
- IR LED Wand
- RGB LED & IR Sensor Game Board
- PixieEscapeSpellGame.ino

Needed

- Computer

Installation Instructions

1. Start your computer.
2. Download the latest version of Arduino from here: <https://www.arduino.cc/en/Main/Software>
3. Locate the Arduino folder on your computer. Drag and drop the "PixieEscapeSpellGame" folder containing the ".ino" file into the Arduino folder.
4. Open Arduino.
5. From the menu, select File -> Open, then navigate to the "PixieEscapeSpellGame" folder and double click the ".ino" file to open it.
6. Plug the included cord into the Arduino and your computer's USB drive.
7. From the menu, select Tools -> Port. Click on the port listing the Arduino Uno board.
8. Click the checkmark in the top left corner of the sketch to verify the code.
9. Click the right arrow in the top left corner of the sketch to upload the code to the Arduino and start the game.

Gameplay

Calibration

Upon running the Arduino sketch, the game enters calibration mode. Touch the IR LED on the wand to each IR sensor on the game board. This allows the game to calculate the maximum IR value for each sensor so the RGB LEDs light up properly during the game.

Tutorial

Guessing a Pixie Location

A random LED will flash on the board. The LED will keep flashing until the wizard hovers the wand over the clear IR sensor next to the flashing LED. When the sensor detects the wand, the LED will glow steady, then turn off. This means the "guess" has been accepted.

Casting "Wingardium Leviosa"

Next LEDs will light up one at a time tracing a "W" shape on the board. This is the spell "Wingardium Leviosa". The board will only accept input from the first LED in the figure, LED0. Hovering the wand over the clear IR sensor next to LED0 will turn LED0 gold, and the other LEDs will stop tracing the "W" shape. The wizard must continue tracing the "W" pattern. LEDs will continue turning gold as the wizard triggers the correct IR sensors. Upon finishing the spell, the "W" will flash blue.

Hiding Pixies

The board will now sparkle for a second, indicating that three pixies are hiding somewhere on the board. This begins normal gameplay.

Playing the Game

There are two modes in the game: guess mode and spell casting mode. The wizard must alternately choose an LED where they believe a pixie is hiding, then cast the Wingardium Leviosa spell to reveal whether it's a hit or miss. This continues until all three pixies have been found.

Guess Mode

The wizard hovers the wand over the IR sensor next to the LED they wish to choose. The LED will turn blue to indicate it detects the wand. Holding the wand over the sensor long enough will turn the LED white, indicating the guess has been accepted. The game is now in spell casting mode.

Spell Casting Mode

The wizard must now cast the "Wingardium Leviosa" spell with their wand. The LEDs in the spell pattern will light up gold as the wizard hovers the wand over the corresponding IR sensors. Completing the "W" shape will cause the LED the wizard chose to turn one of the two colors: green, indicating a pixie has been found (hit) or red, indicating the pixie is not there (miss).

Win

When all three pixies have been found, the board will sparkle to indicate you've won. There is no "lose" option as the wizard keeps guessing until all pixies have been revealed, even if this means guessing every LED on the board.

Replaying

Press the reset button on the Arduino to start a new game. You will need to redo the calibration, and the tutorial will replay in case a new wizard is present.

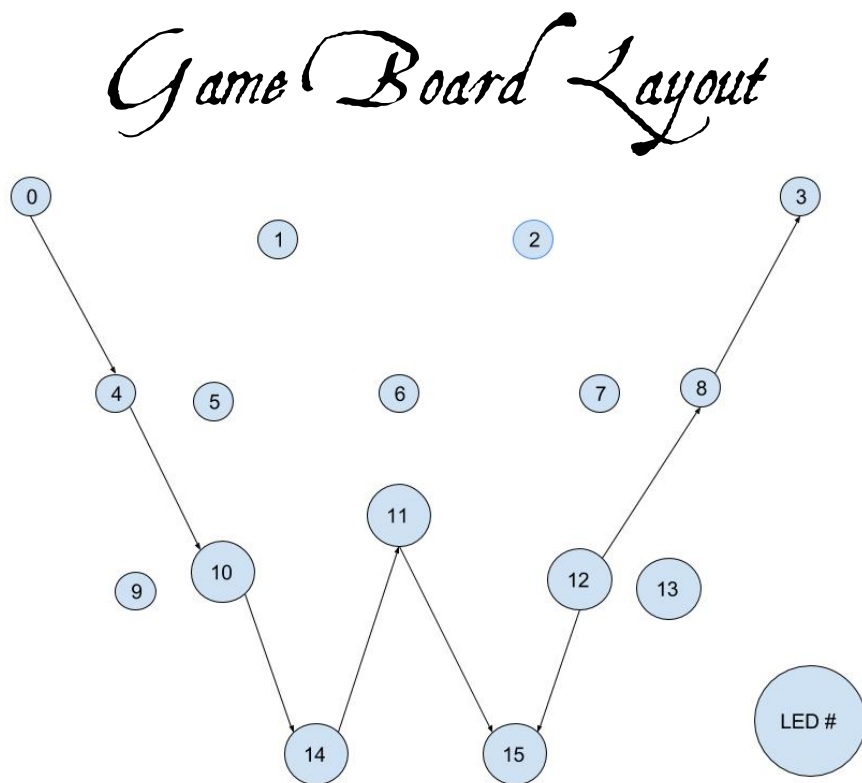


Figure 1: Displays location of RGB LED & IR Sensor pairs and LED numbers included in Wingardium Leviosa spell.