



Youtube

# Engineer-Amel

Youtube channel @engineeramel

YOUTUBE

2025

ESP32 BLOCK BREAKER GAME  
WITH BLUETOOTH CONTROL



[https://www.youtube.com/@en  
gineeramel](https://www.youtube.com/@engineeramel)

# BreakerX – ESP32 Breakout Game

An Arduino-based retro-style Breakout game built for ESP32 with OLED display, Bluetooth controls via the Dabble app, and built-in sound & effects.

## Gameplay Features

Feature	Description	⋮
Classic Breakout	Bounce a ball to destroy bricks using a paddle.	
3 Difficulty Levels	Easy, Normal, Hard – affects paddle size and ball speed.	
Paddle Control	Move left/right using Dabble GamePad over Bluetooth.	
Score System	Gain 10 points per brick; score displayed in-game.	
Lives System	Start with 5 lives; lose one if all balls fall off-screen.	
Victory/Defeat States	Win by clearing all bricks; lose if lives reach zero.	

## Game Mechanics

Mechanic	Description	⋮
Multiball Support	Up to 2 active balls; triggered by power-up.	
Power-Ups	3 Types: <ul style="list-style-type: none"><li>◆ Paddle extender</li><li>◆ Extra life</li><li>◆ Multiball</li></ul>	
Brick Grid	4 Rows × 6 Columns – resets each game.	
Particle Effects	Simple visual effects on brick break using falling pixels.	

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## OLED Display Features (SSD1306)

Visual Element	Description
Main Menu	Displays game title and difficulty selection.
Bricks & Paddle	Drawn as rectangles and rounded bars.
Balls	Circular pixels representing balls.
Power-Ups	Small 6x6 pixel square icons.
Score/Lives HUD	Displayed at the top-left corner of screen.



## Sound Features

Event	Sound Effect
Wall Bounce	Medium pitch beep
Paddle Hit	High pitch tone
Brick Break	Sharp tone + particles
Life Lost	Low tone indicating failure
Win Sound	Victory tone when all bricks are cleared
Background Loop	Alternating tones every 100 ms while playing

# ■ BBreakerX – ESP32 Breakout Game

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## Dabble App Controls

Connect via Bluetooth using [Dabble](#) app:

Button	Function
Up/Down	Navigate difficulty options in menu
Left/Right	Move paddle during gameplay
Select	Confirm selection / start game



## Technical Features

Feature	Description
Non-blocking Sound	Background tones using <code>millis()</code> timing.
Object Pooling	Pre-allocated arrays for balls, power-ups, and particles.
Modular Codebase	Clean separation of setup, logic, and rendering functions.

# hardware and software components:

## 🎮 Control via Dabble App

Item	Description
Dabble App	Smartphone app (by STEMpedia) to emulate a gamepad via Bluetooth
Bluetooth Classic	Communication method between ESP32 and phone via <code>DabbleESP32.h</code>
GamePad Module	Virtual D-Pad + Select button in Dabble used for controlling paddle and menus

## 📦 Software Libraries

Library	Use
<code>Adafruit_SSD1306</code>	Drives the 128x64 OLED screen via SPI or I2C
<code>Adafruit_GFX</code>	Basic graphics library for drawing text/shapes
<code>SPI.h</code>	SPI protocol to communicate with OLED
<code>DabbleESP32.h</code>	Enables ESP32 to connect and receive input from Dabble GamePad
<code>ledcWriteTone() (ESP32)</code>	Used for sound output with non-blocking tone generation

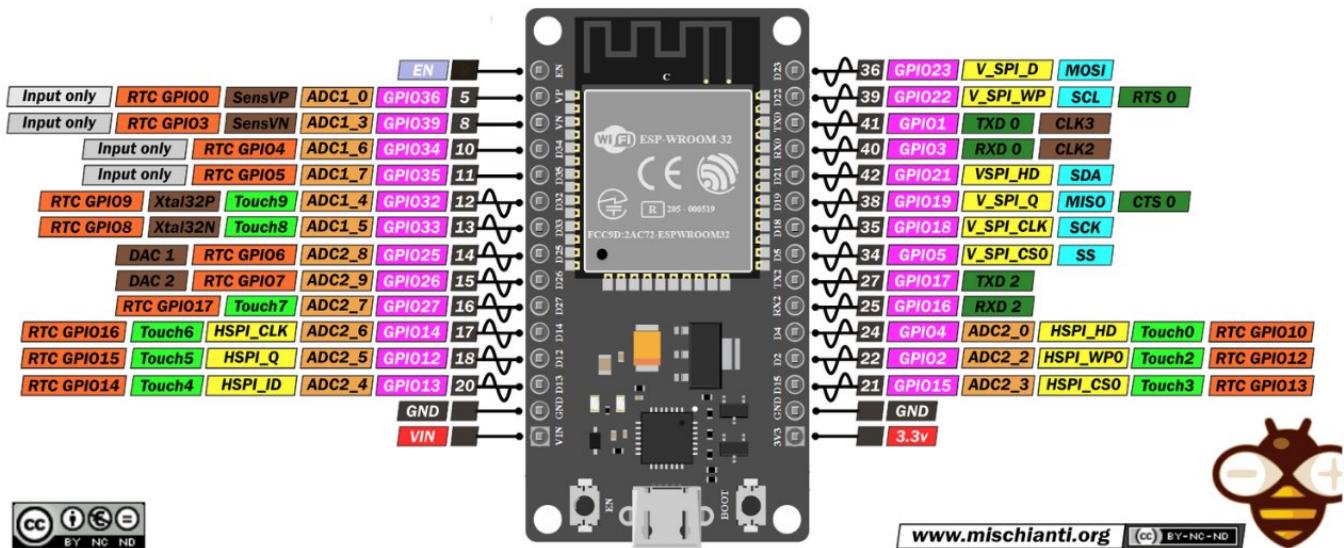
## 📦 Summary of Required Parts

Here's a parts list you can use:

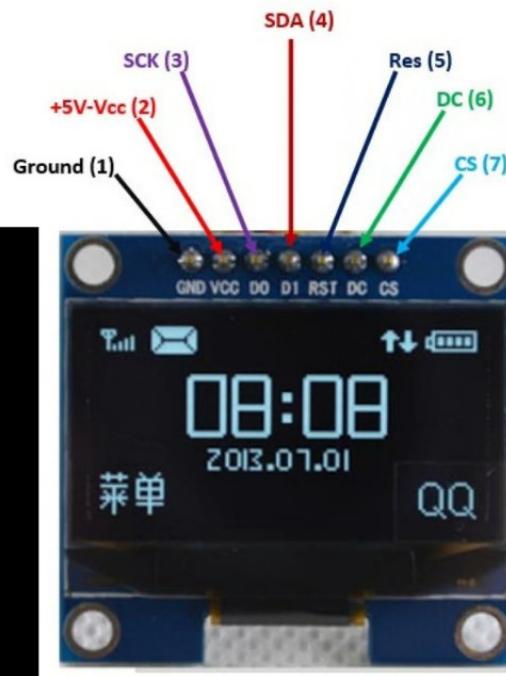
Part	Quantity
ESP32 Dev Board (e.g., NodeMCU)	1
SSD1306 OLED Display (128x64 SPI)	1
Passive Buzzer or Speaker	1
Resistor (100–220Ω for speaker)	1
Jumper Wires	Several
Breadboard (optional)	1
Power Supply (USB/Battery)	1
Smartphone (for Dabble app)	1

# main compounds

## ESP32 DEV KIT V1 PINOUT



Here's the OLED type used:



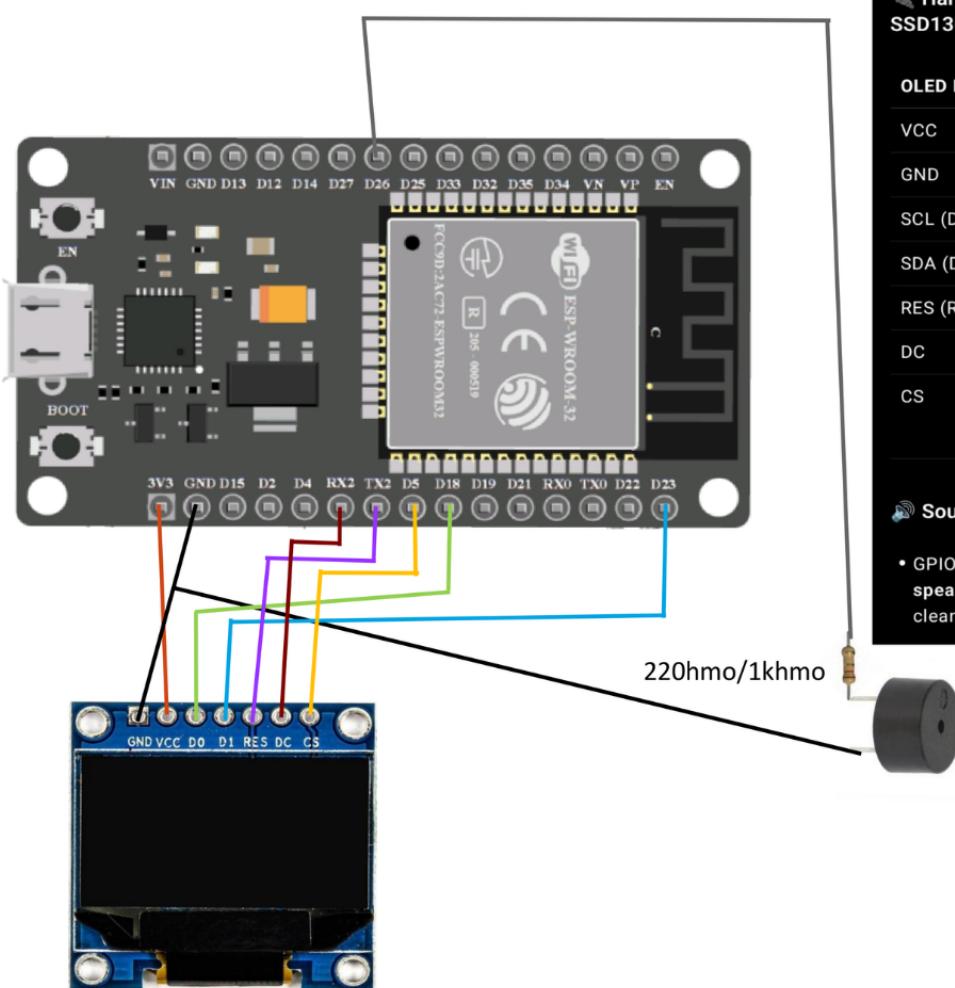
**Display Type:** SSD1306

**Resolution:** 128 × 64 pixels

**Interface:** SPI (Serial Peripheral Interface)

**Library Used:** Adafruit\_SSD1306

# Circuit diagram



## Hardware Wiring (ESP32 to OLED SSD1306 – 7-Pin SPI):

OLED Pin	ESP32 Pin	Function
VCC	3.3V	Power
GND	GND	Ground
SCL (D0)	18	SPI Clock
SDA (D1)	23	SPI MOSI
RES (RST)	17	Reset Pin
DC	16	Data/Command
CS	5	Chip Select

## Sound DAC Pin:

- GPIO 25 → Connect to Amplifier or small speaker via resistor-capacitor filter for clean DAC output.

# Using App

Playstore

Step : 1  
download app in playstore



Arduino ESP Bluetooth  
- Dabble  
STEMpedia

4.3★  
1K reviews ⓘ

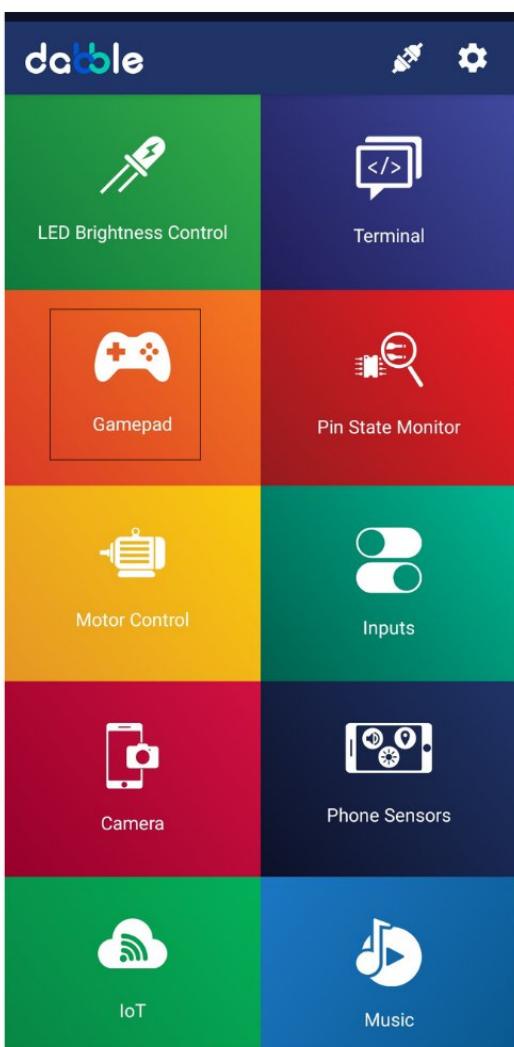
3+  
Rated for 3+ ⓘ

1L+  
Downloads

Uninstall

Open

Step : 2  
select Gamepad



Step : 3  
to select esp32 drive (BBreakerX) and  
pairing to Bluetooth



# Important!

<https://github.com/STEMpedia/DabbleESP32>



```
1 #include <SPI.h>
2 #include <Adafruit_GFX.h>
3 #include <Adafruit_SSD1306.h>
4 #include <DabbleESP32.h>
5
6 // Screen and Display settings
7 #define SCREEN_WIDTH 128
8 #define SCREEN_HEIGHT 64
9 Adafruit_SSD1306 display(SCREEN_WIDTH,
10   SCREEN_HEIGHT, &SPI, 16, 17, 5); //
```

DabbleESP32 1.5.1

this library install only the sketch program code work properly

DabbleEsp32.h library download for this link  
<https://github.com/STEMpedia/DabbleESP32>