adafruit learning system

AdaBox 014

Created by John Park

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Introduction

Hi there!

If you're looking to subscribe to AdaBox, click here! (https://adafru.it/tNC)

If you're here, it's because you were given the gift of electronics with an AdaBox! Perhaps you are a beginner who is getting started with your AdaBox. Or maybe you just want to relive what it's like being a beginner at electronics again. But most of all, you want to learn how to build and make creative, awesome stuff with electronics, graphics, and coding! (If, rather than learn all that, you'd like to look at pictures of cats instead, please check https://www.adafruit.com/galleries/cats-of-engineering (https://adafru.it/oAd))

And, you're in luck: there's *never* been a better time. Seriously. We're not just saying that. It's bonkers how great a time this is for you to learn electronics, graphics, coding, and wireless Bluetooth LE magic with images, lights, and sound!

Gone are the days where you need thousands of dollars of equipment and a physics/math background. Nowadays, if you want to learn to work with electronics and code microcontrollers, you can jump right in for $100 or less and any sort of computer. And we're talking about learning *a lot* of electronics, graphics, coding, and Bluetooth LE wireless action - from the basics of setting up a microcontroller, to customizing your graphics on a beautiful TFT display, and doing it wirelessly! From making festive interactive snowglobes, to beaming images THROUGH THIN AIR to your custom made ornaments!!

Who is this for?

Anyone who is interested in learning how to program and build interactive projects, and with access to a modern web browser. That's pretty much the minimum. Remember, this guide is specifically for people who have purchased or received an AdaBox subscription!

You don't need to know a lot of physics or math, and just like an Art Degree isn't required for making art and being creative, **you *don't* need to have a computer science or mechanical engineering degree**. It helps if you're comfortable using computers but that's a skill most people pick up through life.

If you know how to program already - great! If not, don't worry, we'll teach you enough to be dangerous.

Who **isn't** this for?

While you can follow along without an AdaBox, it will not make as much sense unless you have *all* of the components and more which either came as a gift or purchased yourself - remember, the goal is helping beginners!

This guide is also not for crows. Corvids are awesome, but they prefer analog tools (https://adafru.it/CBc).

If you're an expert, please visit our hundreds other tutorials and jump right in at learn.adafruit.com (https://adafru.it/dlu)

Who are you?

Great question. This is me:

I'm Ladyada, and I love to teach people how to build stuff and how they can be creative with technology.

So, are you ready?

Let's do this thing!

Want to buy past AdaBoxes?

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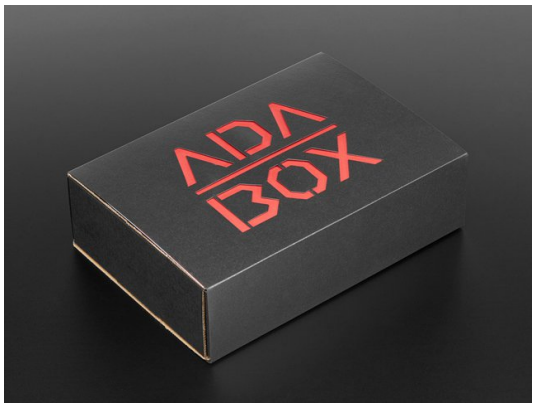

AdaBox005 – Break for Pi

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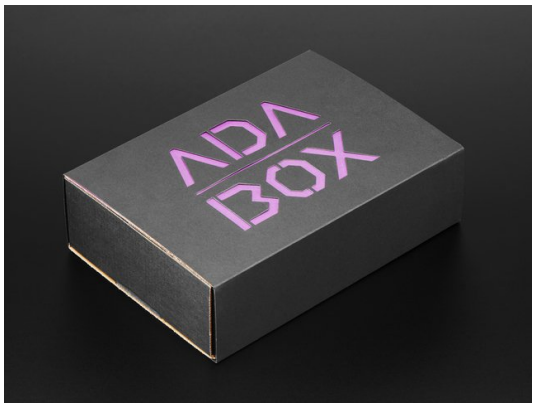

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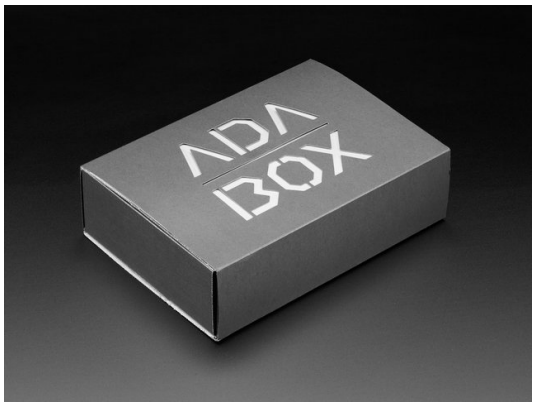

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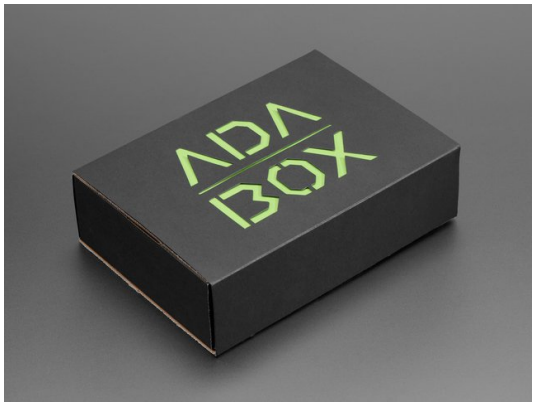

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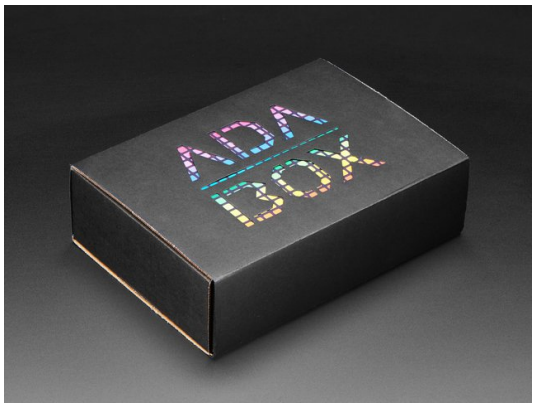

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Unboxing AdaBox 014

It's beginning to look like Ada-BOX-mas
Everywhere you go
Let all your ideas flow, for projects you want to show
With buttons and LEDs all aglow

Exactly two years ago, Adafruit released ADABOX 006 featuring the Circuit Playground Express and CircuitPython. It was a revolution in how to program electronics, and our first attempt at seeing how ADABOXians would adapt to the transition from Arduino-programmed boxes. And it was a hit! People loved the easy all-in-one Circuit Playground and programming circuits in Python.

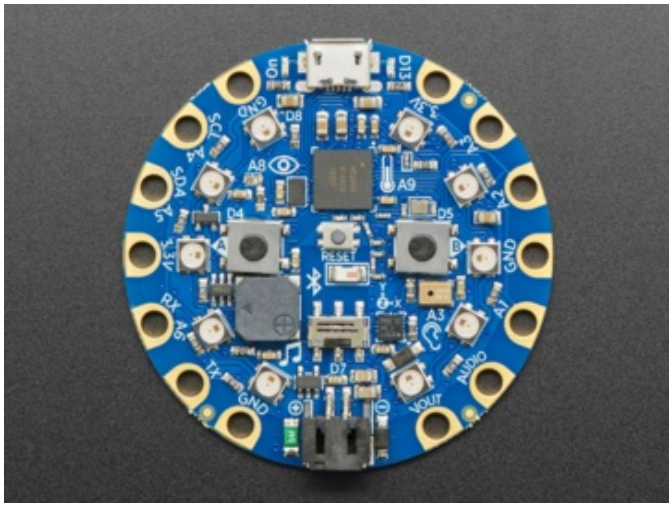
Now, two years later, we're going further - with the **Circuit Playground Bluefruit** with Bluetooth LE support so now we can make our projects wireless! We've also added a colorful 'TFT Gizmo' graphical display, a rechargeable battery and USB charger, as well as a few cases and enclosures to help you craft a beautiful holiday decoration.

Thanks to Digi-Key and Nordic Semiconductor for their support of AdaBox and the development of the Circuit Playground Bluefruit. We could not have created such an awesome box without their help!

AdaBox 014 Contents

Circuit Playground Bluefruit

It looks a lot like the 'Express you know so well: built-in motion, light and temperature sensors, microphone, speaker, 10 NeoPixels, and capacitive-touch pads. But now, the brain of the Playground is the powerful Nordic nRF52840 with Bluetooth Low Energy support.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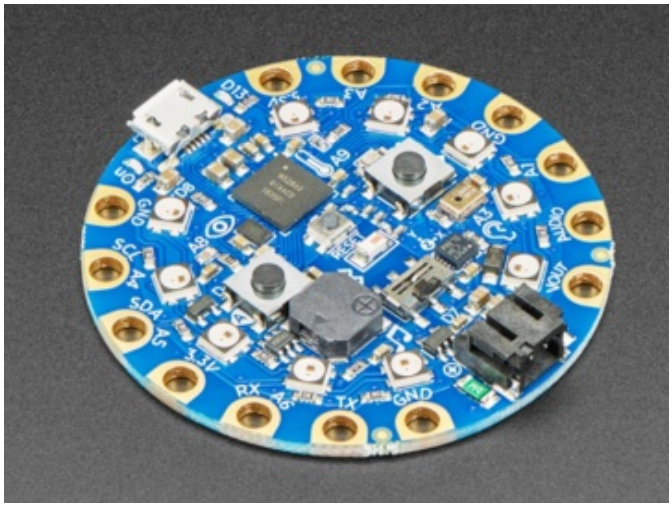
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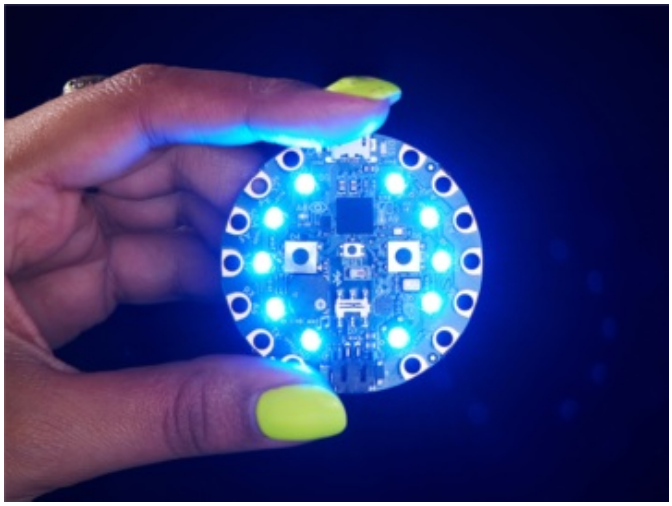
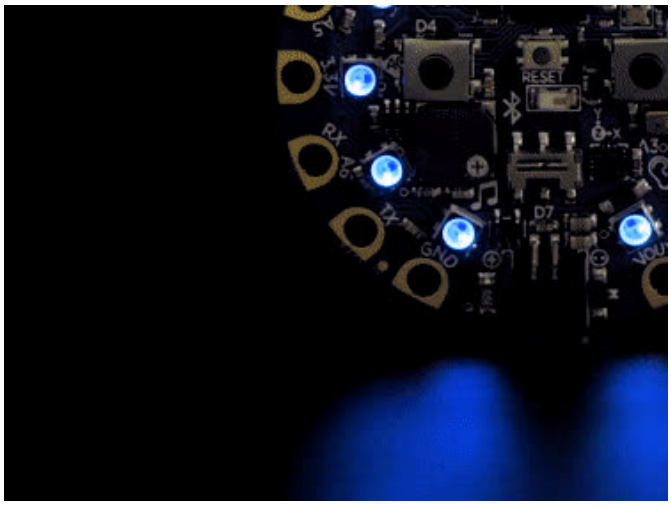
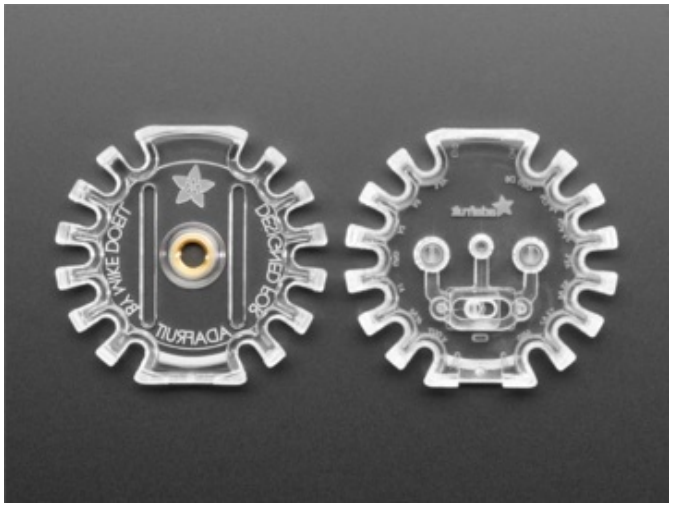
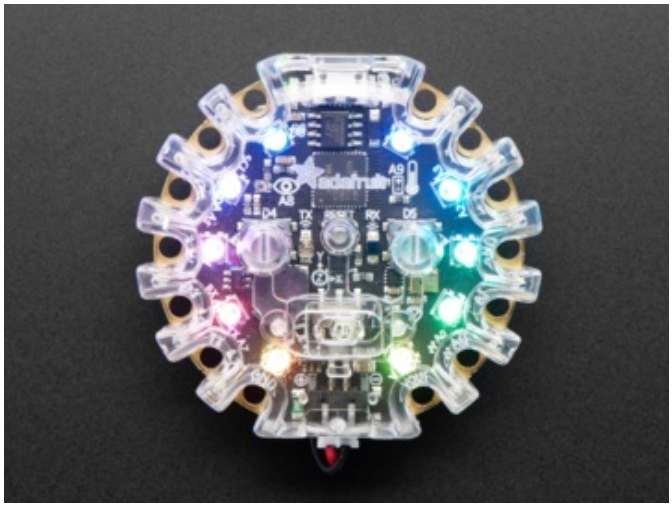


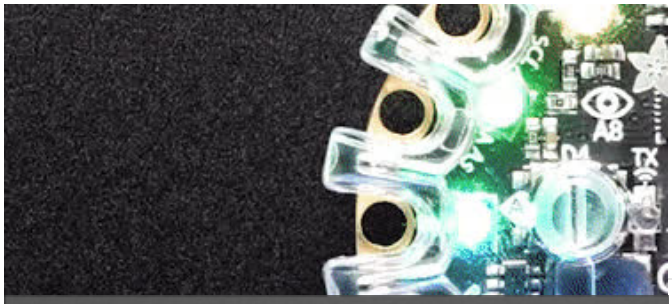


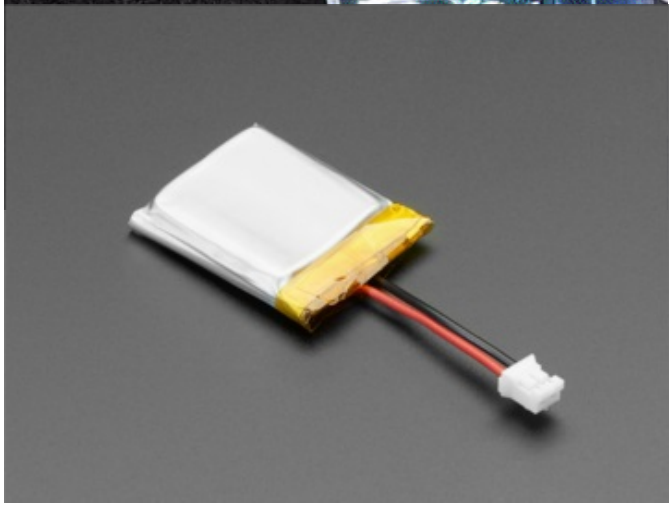


Circuit Playground Enclosure

Keep your Circuit Playground Bluefruit (CPB for short) safe in this snap-together enclosure.

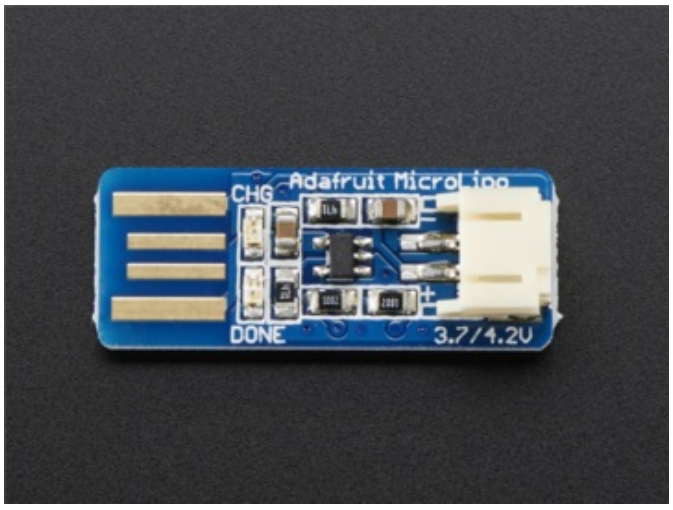


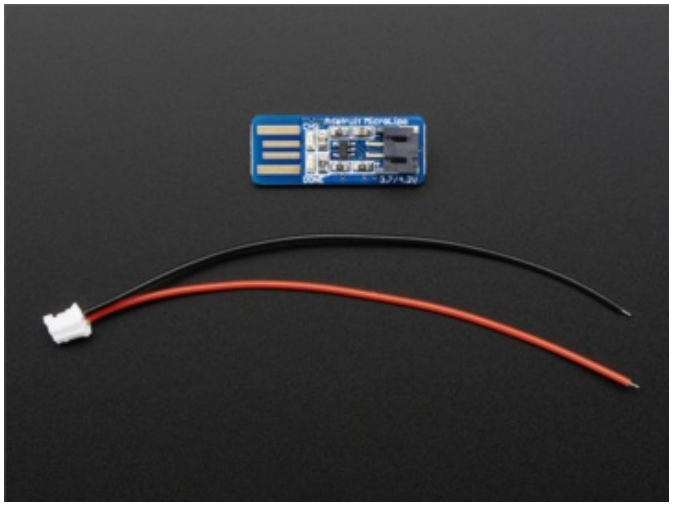




Lithium Polymer Battery

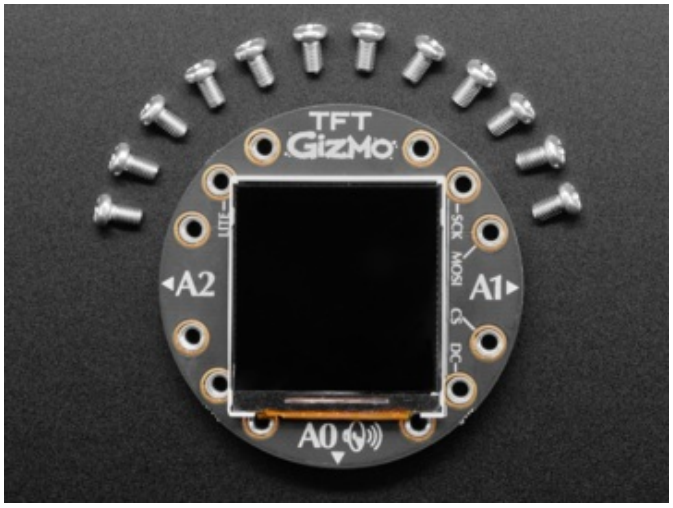
The CPB can be powered with this battery for portable use, so it's truly wireless.

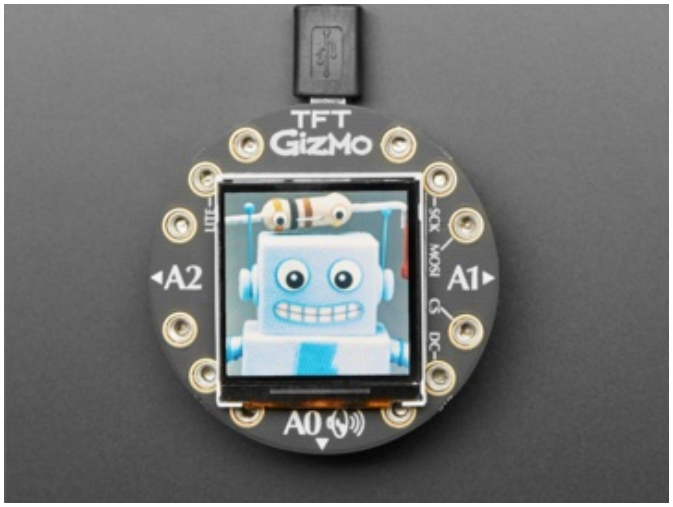


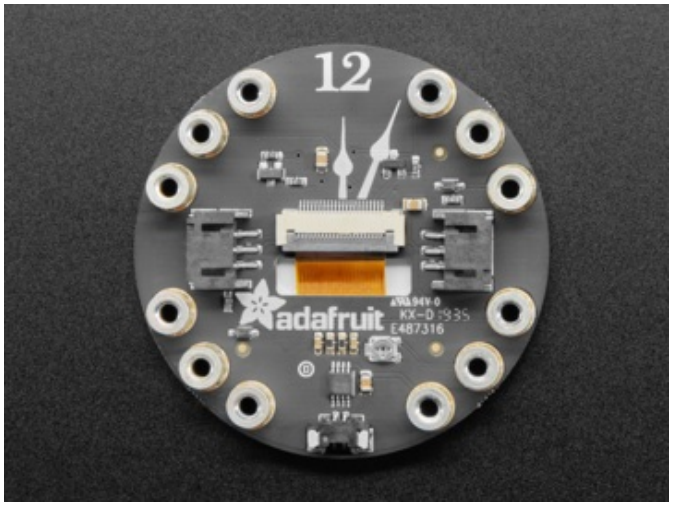


USB LiPo Charger

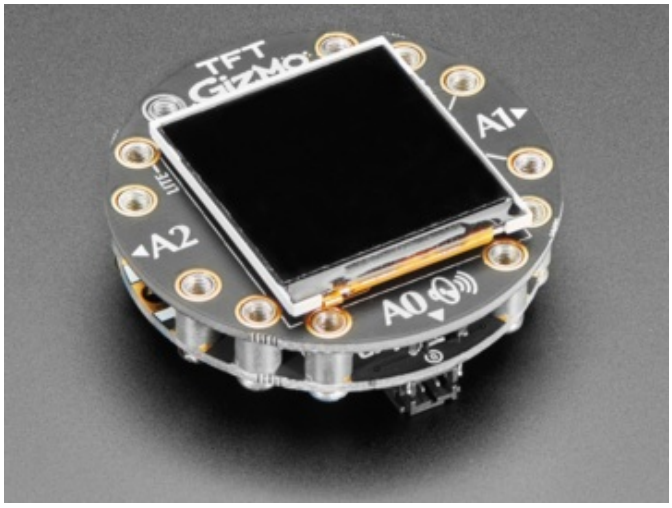
The CPB doesn't have built-in charging support. So use this simple charger board to keep your battery topped-up.





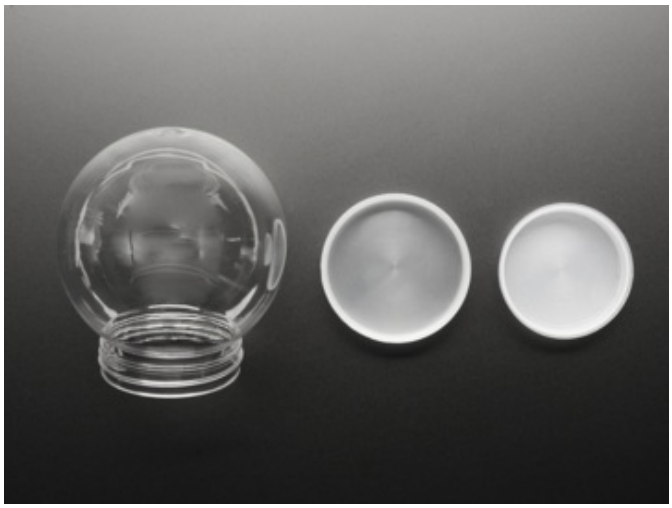


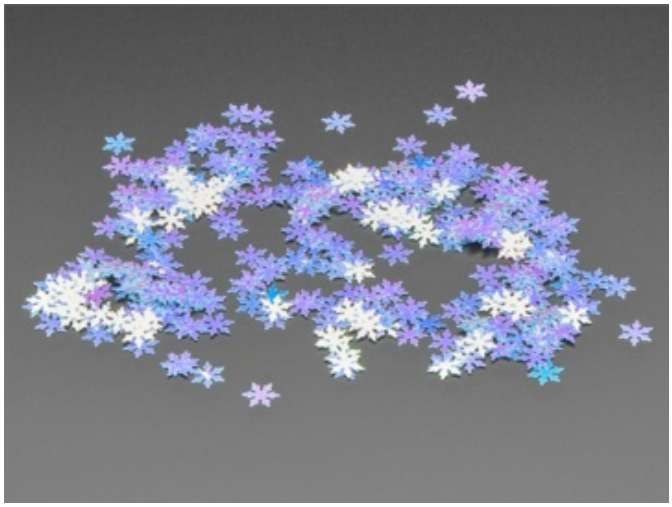
Bolt on this 240x240 pixel color IPS TFT LCD display for bright images, GIFs and animations. You can even fit the LiPoly battery in between the two layers formed by the Gizmo and the Circuit Playground Bluefruit when they are screwed together.



Snow Globe + Snowflakes Kit

This large empty container fits the CPB plus battery in its base. Decorate the globe with figurines or art, then fill with water and the sparkly snowflakes. Now you have an electronic snow globe that can react to motion or wireless control.





DIY Ornament

These clear plastic spheres are just large enough to fit a CPB plus the TFT Gizmo to make a cute electronic ornament.

Diffraction Glasses

Holiday lights are even more dazzling with these grated glasses that make points of light sparkle and shimmer.

Bonus Extras!

HackSpace Magazine

Curl up on a cold day with a copy of HackSpace by the Raspberry Pi Foundation. Get inspired by cool builds, and creative folks in the making community.

Circuit Playground Plushie

This AdaBox is our largest yet - literally! We had to get a bigger box to fit everything, including a plushie from our Circuit Playground video series.

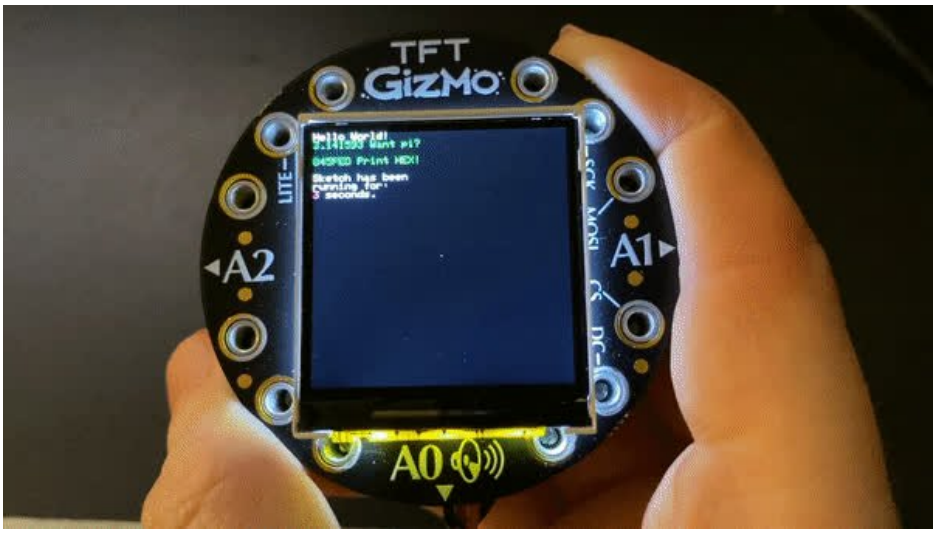
Adafruit Circuit Playground Bluefruit

Adafruit Circuit Playground Bluefruit (https://adafru.it/GYc)

Adafruit Circuit Playground TFT Gizmo

Adafruit Circuit Playground TFT Gizmo (https://adafru.it/Gfi)

TFT Gizmo Test



Once you've assembled the TFT Gizmo onto your Circuit Playground you can test it by loading one of these pre-made UF2 onto your Circuit Playground with the TFT Gizmo attached - it will perform a graphics test so you know that the Gizmo's attached!

Be sure to use the correct UF2 file for the Circuit Playground board you have.

Circuit Playground Express

If you have a Circuit Playground Express (https://adafru.it/wpF), download this UF2 file by clicking below:

https://adafru.it/IEA

https://adafru.it/IEA

Circuit Playground Bluefruit

If you have a Circuit Playground Bluefruit (https://adafru.it/Gpe), download this UF2 file by clicking below:

https://adafru.it/HDt

https://adafru.it/HDt

Running Text Example UF2

Once you've downloaded the appropriate UF2 file from above, plug in your Circuit Playground to your computer with a data/sync cable.

Double-click the reset button so that the boot drive folder shows up. This folder should be called **CPLAYBOOT** for the CP Express and **CPLAYBTBOOT** for the CP Bluefruit.

Drag-n-drop the downloaded UF2 onto **CPLAYBOOT** or **CPLAYBTBOOT** folder.

Press reset button to launch the code. If you don't get graphics on the TFT, check the assembly instructions on this page (https://adafru.it/Hb9)

This sketch is in Arduino, so after you've run this UF2, if you want to go back to CircuitPython, you'll need to re-install the CircuitPython UF2 (https://adafru.it/Em8)

Circuit Playground TFT Gizmo Ornament Snow Globe

Circuit Playground TFT Gizmo Ornament Snow Globe (https://adafru.it/Hcw)

TFT Gizmo Animated Eye

TFT Gizmo Animated Eye (https://adafru.it/Hcy)

Cyberpunk Santa Eye

Cyberpunk Santa Eye (https://adafru.it/Hgf)

Wireless Image Transfer with Circuit Playground Bluefruit and TFT Gizmo

Wireless Image Transfer with Circuit Playground Bluefruit and TFT Gizmo (https://adafru.it/GXa)

Bluefruit Playground Hide and Seek

Bluefruit Playground Hide and Seek (https://adafru.it/HjC)

Turtle Graphics in CircuitPython on TFT Gizmo

Turtle Graphics in CircuitPython on TFT Gizmo (https://adafru.it/GYd)

Snow Globe with Bluefruit

Snow Globe with Bluefruit (https://adafru.it/HgA)

Bluetooth Turtle Bot with CircuitPython and Crickit

Bluetooth Turtle Bot with CircuitPython and Crickit (https://adafru.it/Hcx)

Circuit Playground-O-Phonor

Circuit Playground-O-Phonor (https://adafru.it/Hcz)

3D Printed CPB Gizmo Ornaments

3D Printed CPB Gizmo Ornaments (https://adafru.it/HgB)

3D Print a Turtle Case for TFT Gizmo and Circuit Playground Bluefruit

3D Print a Turtle Case for TFT Gizmo and Circuit Playground Bluefruit (https://adafru.it/HcA)

Circuit Playground Bluefruit Pumpkin with Lights and Sounds

Circuit Playground Bluefruit Pumpkin with Lights and Sounds (https://adafru.it/HcB)

Luminary Lanterns

Luminary Lanterns (https://adafru.it/HgC)

Getting Started with CircuitPython and Bluetooth Low Energy (https://adafru.it/FxH)

NeoPixel Animation Remote Control

NeoPixel Animation Remote Control (https://adafru.it/HE0)

Bluefruit Playground App

Bluefruit Playground App (https://adafru.it/HCE)

TensorFlow Lite for CPB Quickstart

TensorFlow Lite for CPB Quickstart (https://adafru.it/HCF)

Circuit Playground TFT Gizmo Dreidel

Circuit Playground TFT Gizmo Dreidel (https://adafru.it/HCG)

ANCS Notifier Gizmo for iOS

ANCS Notifier Gizmo for iOS (https://adafru.it/IAG)