littleBits™

SNAP THE GAP STEM KIT BIT™ INDEX (MUSIC)

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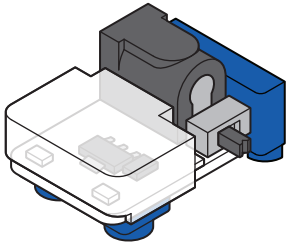
a30 mounting board

* Occasionally Bits™ get updated, so the features or appearance of your Bits may differ from those used in this guide.

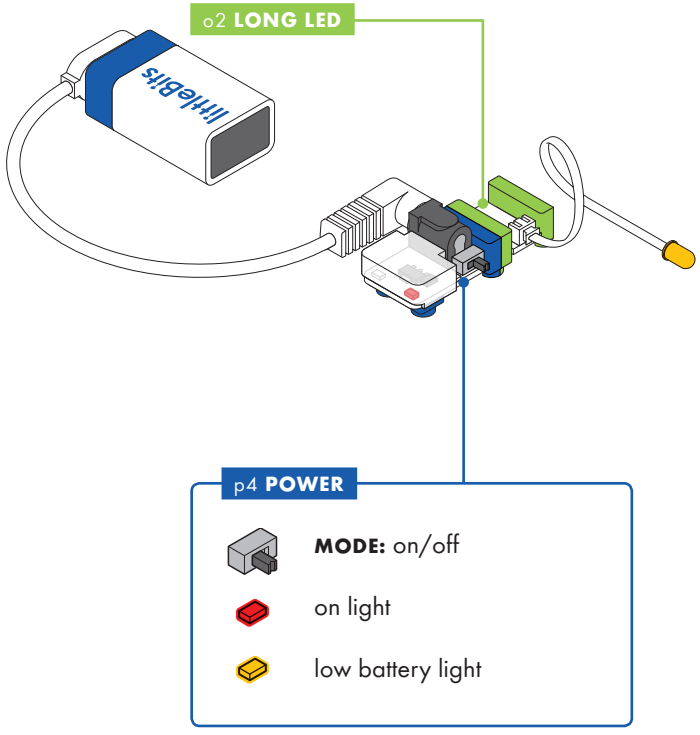
p4 POWER



MEET THE BIT

Every circuit starts with power. It provides the electricity that makes your Bits spin, buzz, blink, and shine.

SAMPLE CIRCUIT



HOW IT WORKS

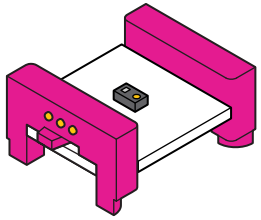
The p4 power Bit converts the 9 volts of electricity in the battery to the 5 volts that littleBits circuits run on.

The power Bit also sends a signal through your circuit. Controlling this signal with inputs is how you control your circuit.

REAL WORLD ANALOGIES

PHONE CHARGER

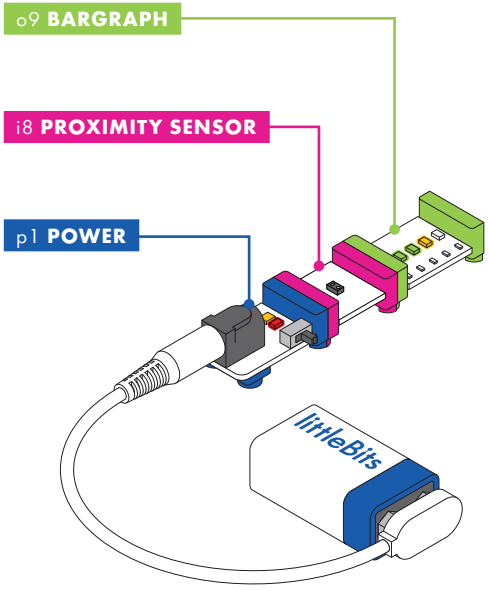
i8 PROXIMITY SENSOR



MEET THE BIT

This Bit beams an infrared light that allows it to sense objects in front of it.

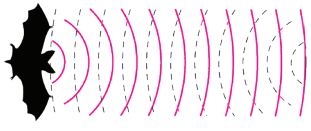
SAMPLE CIRCUIT



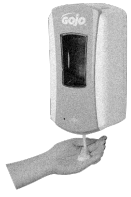
HOW IT WORKS

The proximity sensor is like a pair of eyes for your circuit. It detects objects by using an infrared beam to sense what's in front of it. As the object gets closer to the proximity sensor, more signal will pass to the following Bits in the circuit.

REAL WORLD ANALOGIES



BAT VISION

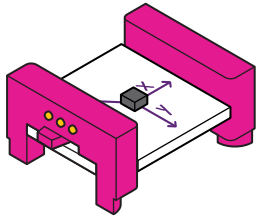


SOAP DISPENSER

DOLPHIN ECHOLOCATION

AUTOMATIC DOOR

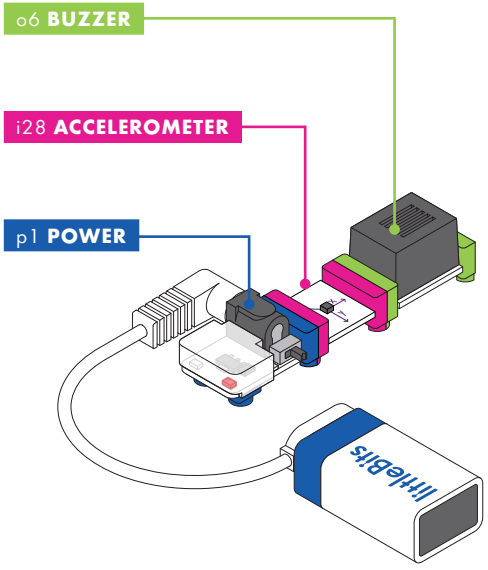
i28 ACCELEROMETER



MEET THE BIT

The accelerometer Bit senses change in speed. Use this Bit to control your circuits with movement.

SAMPLE CIRCUIT

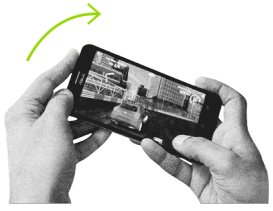


HOW IT WORKS

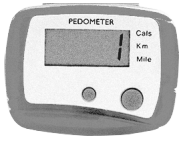
The accelerometer senses how quickly you are speeding up or slowing down. This helps it detect different types of motion, like shaking or tilting.

The faster the acceleration, the more signal will be sent to the Bits that follow. Try moving moving your circuit around with different types of motion to see how it affects your outputs.

REAL WORLD ANALOGIES



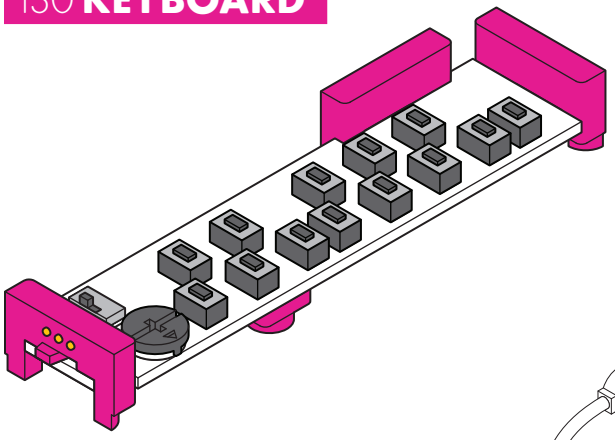
SMART PHONE



STEP COUNTER

TILT DETECTOR

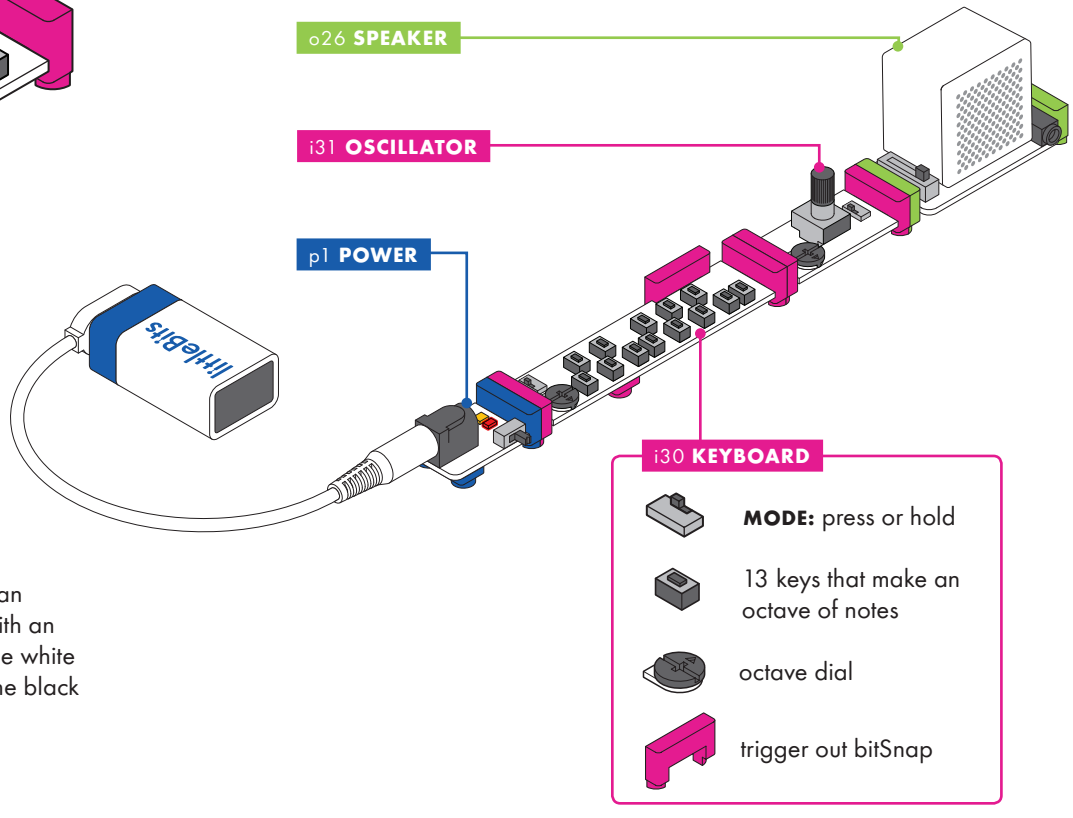
i30 KEYBOARD



MEET THE BIT

The keyboard Bit features 13 buttons that make up an octave of notes like a piano. This Bit can be used with an oscillator Bit to play melodies. Similar to a piano, the white keys on the keyboard are on the bottom row, and the black keys are spaced on top.

SAMPLE CIRCUIT



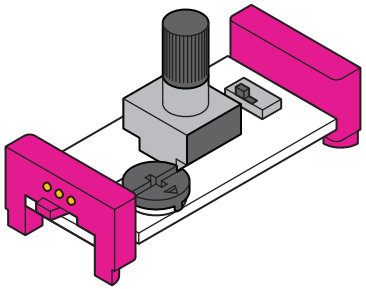
HOW IT WORKS

The keyboard has two modes: **PRESS**, which only produces output when you press a button, and **HOLD**, which will sustain the last note you played. You can use the **OCTAVE DIAL** to change the playable range. The top bitSnap is a **TRIGGER OUT**, which sends an on or 5 volt signal whenever a key is pressed. Try using on the **TRIGGER IN** of the envelope or other Bits.

REAL WORLD ANALOGIES

GRAND PIANO

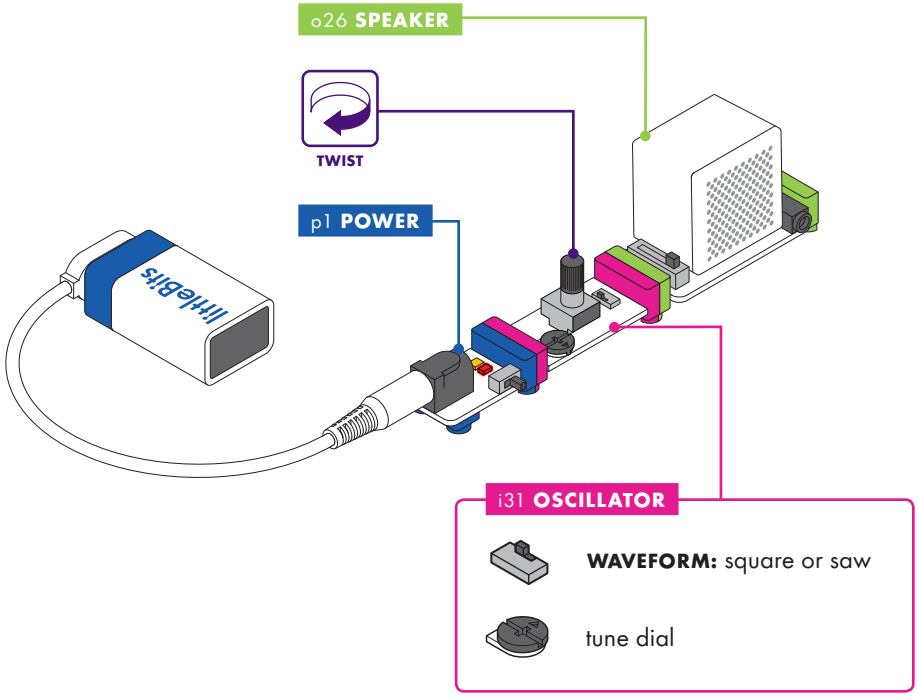
i31 OSCILLATOR



MEET THE BIT

The oscillator is a sound source that is capable of creating audio tones that will be used in almost every sound experiment you create with your Bits.

SAMPLE CIRCUIT

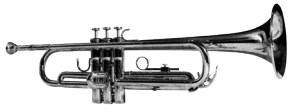


HOW IT WORKS

The oscillator allows you to generate sounds when connected to the speaker Bit. The **WAVEFORM** switch changes the output. The invisible sound wave will either look like a square or a saw. The square has a hollow sound, similar to a flute. The saw has a strong, buzzy sound, similar to brass instruments. It also features a **PITCH** knob in the center and a **TUNE** pitch dial. The oscillator's frequency range is 0.3 Hz to 4000 Hz.

REAL WORLD ANALOGIES

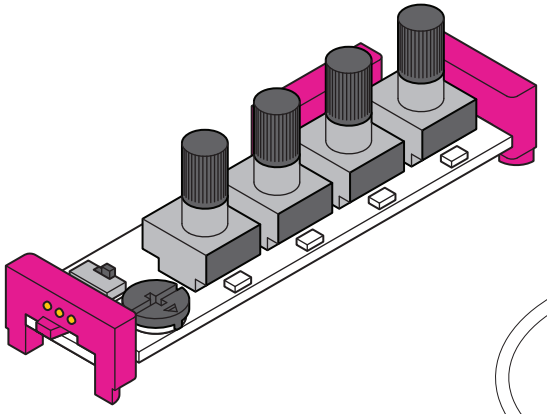
FLUTE



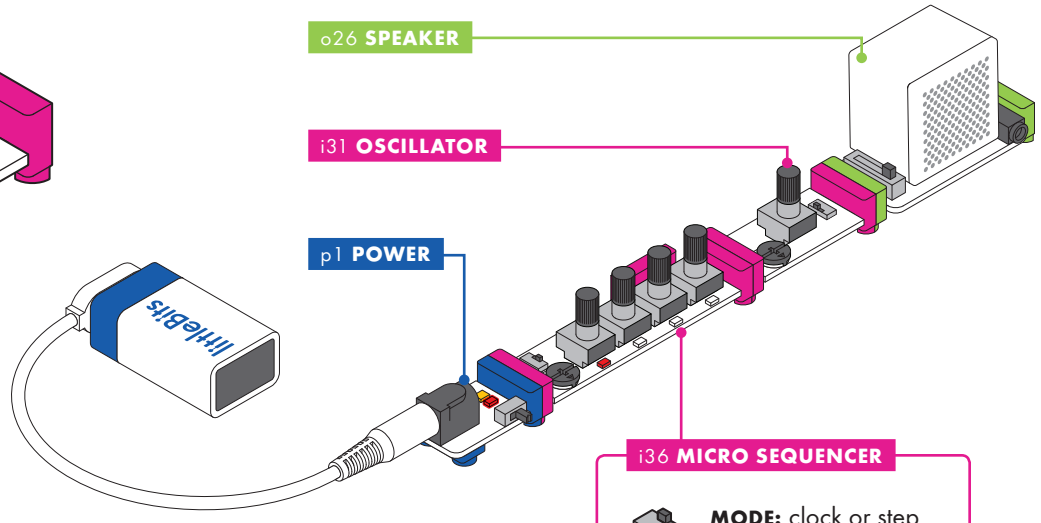
TRUMPET

SAXOPHONE

i36 **MICRO SEQUENCER**



SAMPLE CIRCUIT



HOW IT WORKS

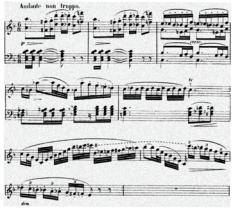
The micro sequencer sends out voltages based on the position of each of the four **STEP** knobs. Turn a knob fully counterclockwise to make the step silent.

Use the Bit in **SPEED** mode to set the speed using the dial, or flip the switch to **STEP** mode to use an input Bit like a pulse or button for control. It also has a **TRIGGER OUT**, which you can send to any of your other Bits. This can be used to trigger other Bits like the envelope.

MEET THE BIT

The micro sequencer creates short melodies controlled by the pitch knobs. Connect it to an oscillator and it will step through the "sequence" consecutively to make a melody (the LEDs tell you which step is active).

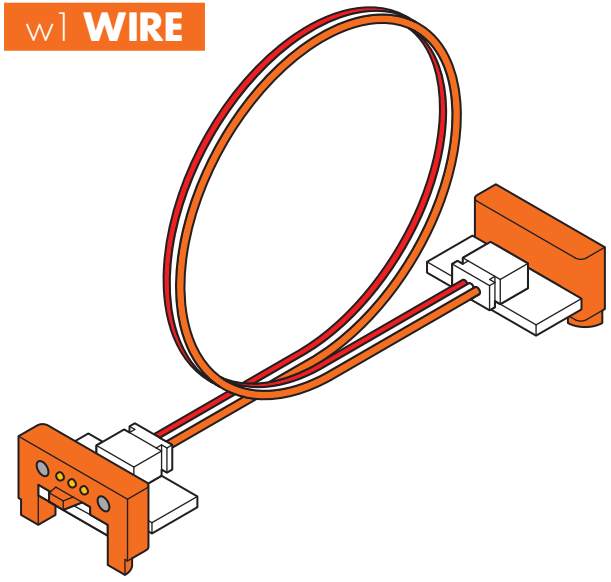
REAL WORLD ANALOGIES



MUSICAL SCORE

CELL PHONE RING TONE

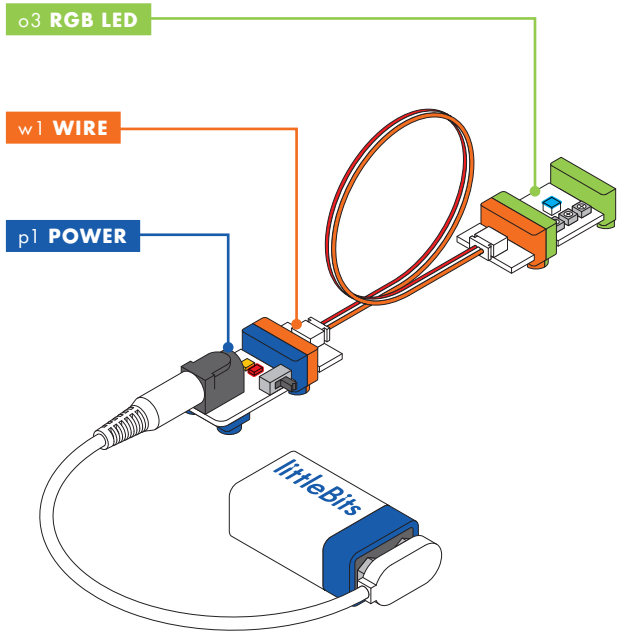
w1 WIRE



MEET THE BIT

The wire Bit has a flexible wire running between its two bitSnaps. This allows you to place your Bits farther apart, turn corners, and make connections that can twist, turn, and spin.

SAMPLE CIRCUIT



HOW IT WORKS

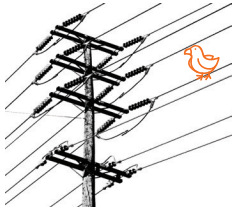
The wire doesn't change the signal in any way – it just carries the signal over from one Bit to another. Each wire Bit is 6 inches (15 cm) long.

MINI-CHALLENGE

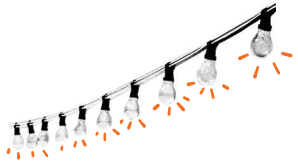
Can you invent a circuit that you wrap around your arm?

REAL WORLD ANALOGIES

EXTENSION CORD

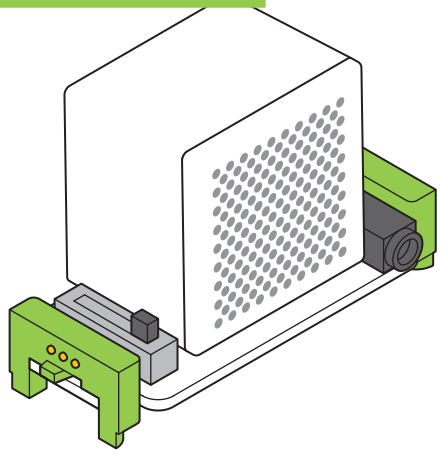


POWER LINES



STRING OF LIGHTS

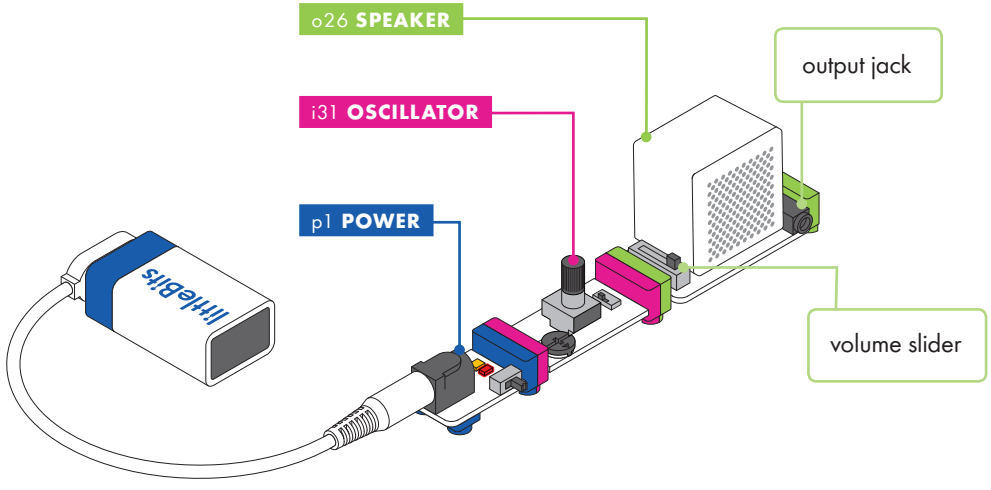
o26 SPEAKER



MEET THE BIT

Amplify your sonic explorations! The speaker Bit is a tiny speaker that lets you hear the signals coming from an oscillator, an MP3 player, or a codeBit. Pair it with these Bits to add music or sound effects to your inventions.

SAMPLE CIRCUIT



HOW IT WORKS

The speaker turns audio signals into vibrations that make sound. You can control the speaker's volume with a slider on the left side of the Bit. It also features an output jack on the right side of the Bit that you can connect to headphones, an amplifier, or a computer. When you connect to the output jack, sound will come out of the connected device (like your headphones) instead of through the speaker.

The speaker Bit will only make sound with Bits that create audio signals, such as the oscillator, MP3 player, or codeBit.

MINI-CHALLENGE

What is the strangest sound that you can invent?

REAL WORLD ANALOGIES

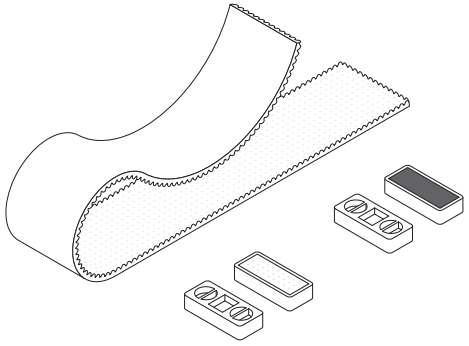
VOCAL CORDS

LOUDSPEAKER

GUITAR AMP

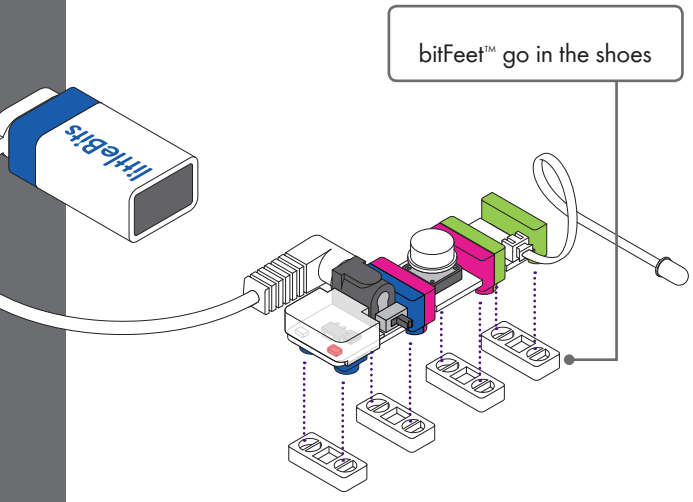
PHONE SPEAKER

a5 MAGNET SHOES
a6 HOOK & LOOP SHOES



MEET THE ACCESSORY

Shoes slip onto your Bits' feet and hold your circuit together. On the bottom of your shoes you'll find magnets or hook & loops, which are great for securing your circuits to different surfaces.



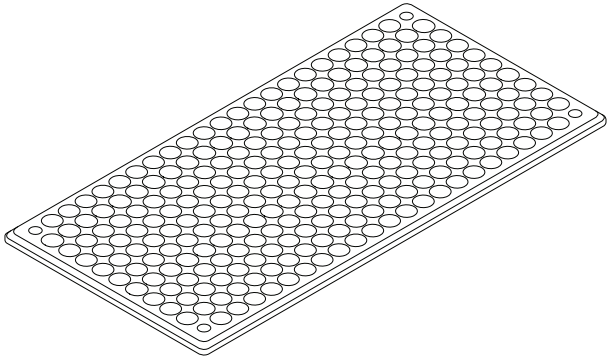
HOW IT WORKS

First, snap together your littleBits circuit. Then press the feet of your Bits into the holes of the shoes and place it on your chosen surface.

Magnet shoes allow you to adhere your circuit to any magnetic surface. Try your refrigerator or your locker!

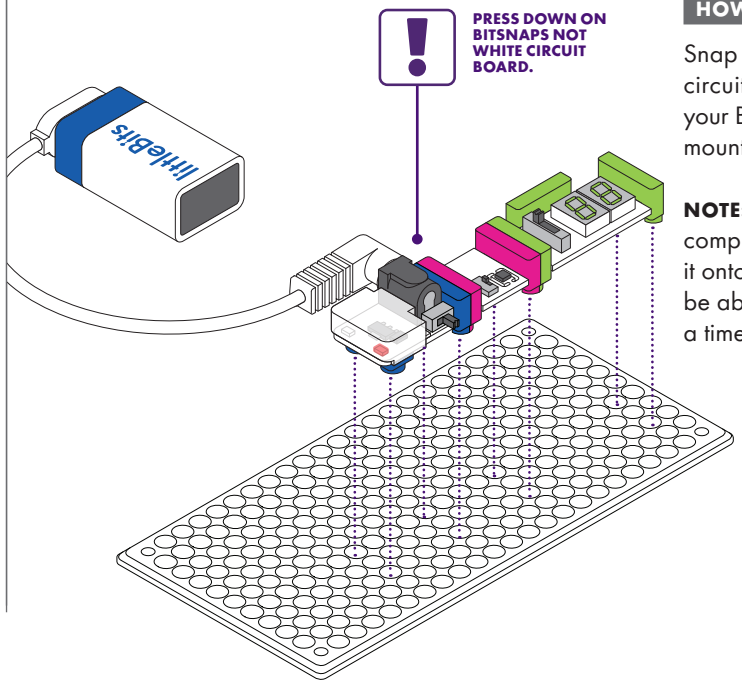
Hook & loop shoes come with an adhesive-backed hook & loop strip. The strip can be cut to any size you desire and affixed to clothing, fabric, or any flexible surface.

a30 MOUNTING BOARD



MEET THE ACCESSORY

The mounting board is like the backbone of some of your inventions. It allows you to keep your circuit intact and move it around with ease! It also provides structure which is helpful for building out projects, like a vehicle.



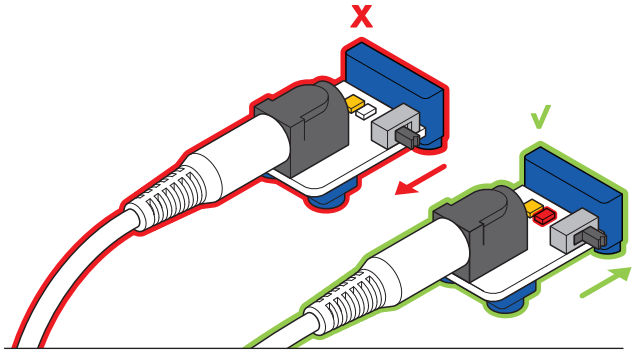
HOW IT WORKS

Snap together your littleBits circuit and press the feet of your Bits into the holes of the mounting board.

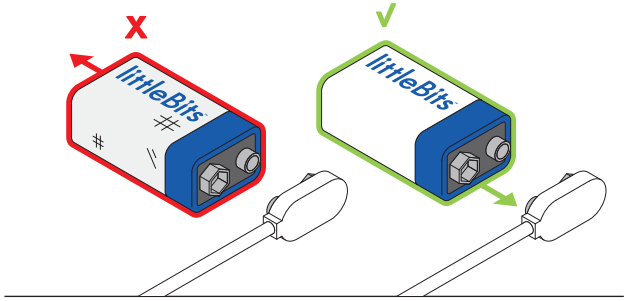
NOTE: Your circuit must be complete before you press it onto the board. You won't be able to add Bits one at a time.

TROUBLESHOOTING

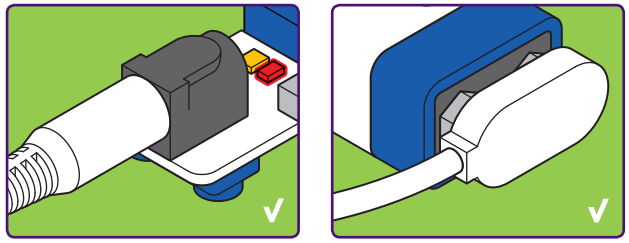
IN-DEPTH TROUBLESHOOTING AVAILABLE AT LITTLEBITS.COM/FAQ OR ON THE LITTLEBITS INVENT APP.



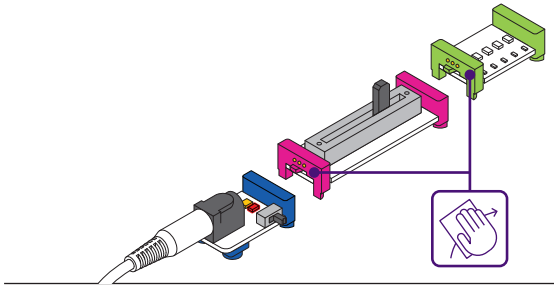
1 **MAKE SURE YOUR POWER BIT™ IS ON.** You should see a red LED illuminated on the board.



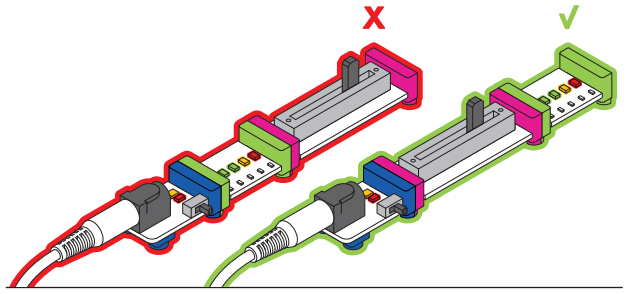
2 **TRY SWAPPING IN A NEW 9 VOLT BATTERY.** Low batteries can cause a circuit to act erratically. Bits™ have different power demands. For example: a DC motor may appear to not be working while a light still shines brightly.



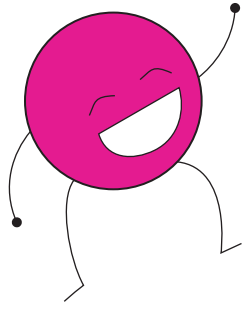
3 **ENSURE THE POWER CABLE IS SECURELY FASTENED TO BOTH THE POWER BIT AND THE BATTERY.**



4 **CHECK YOUR CONNECTIONS**. Are all the Bits securely snapped to each other? You can also try gently wiping down the ends of the bitSnaps with a soft cloth (like your sleeve). Sometimes dust gets in the way of a strong connection. Try unsnapping, cleaning the bitSnaps, and snapping it all back together again.



5 **MAKE SURE YOUR BITS ARE ARRANGED IN THE PROPER ORDER.** Remember that you always need a power Bit & power supply at the beginning of each circuit, and an output Bit at the end. If the last Bit in your chain is an input, then it won't do anything to affect your circuit.



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