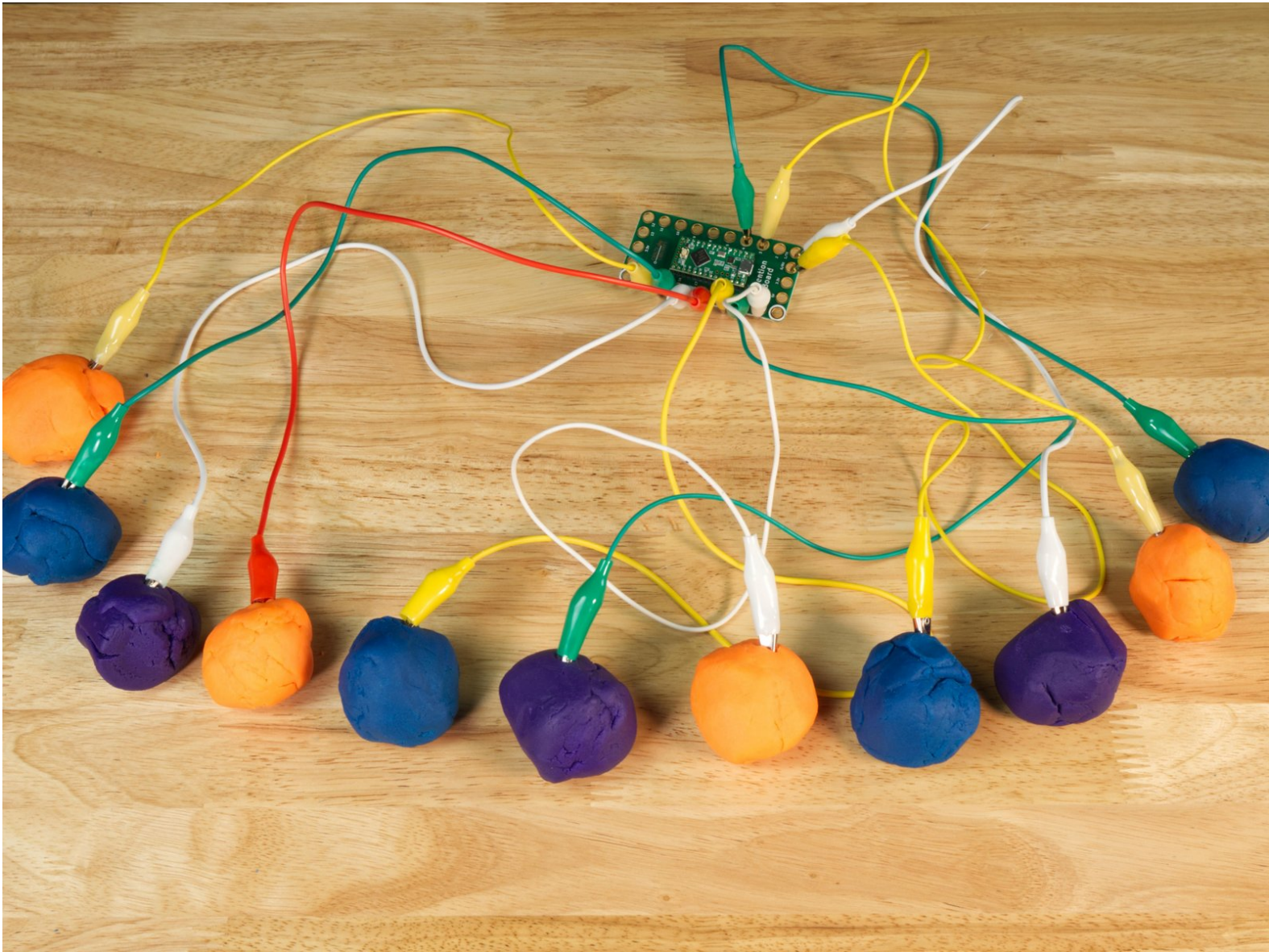




# BDG-11 Piano

Make a touch piano that plays 11 notes and works with a browser-based keyboard.

Written By: Pete Prodoehl



# INTRODUCTION

Make a touch piano that plays 11 notes and works with a browser-based keyboard.



## TOOLS:

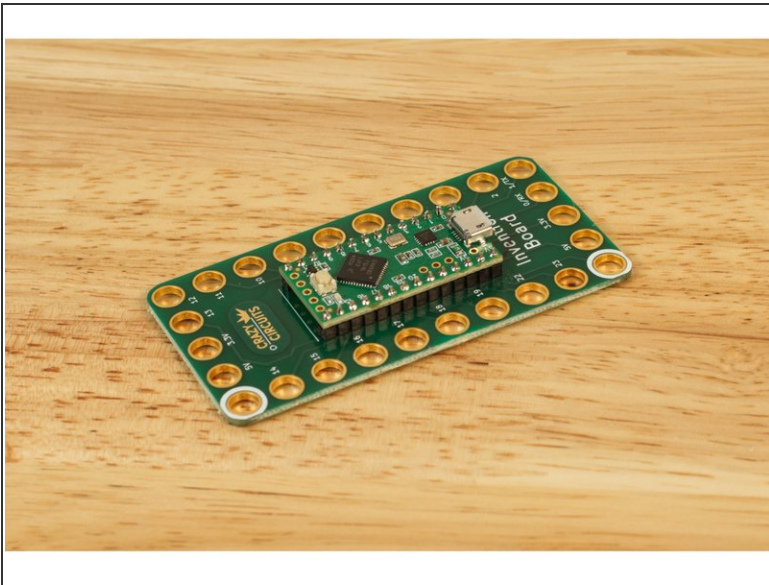
- [Computer](#) (1)



## PARTS:

- [Crazy Circuits Invention Board](#) (1)
- [Alligator Clips](#) (11)
- [Squishy Circuits Conductive Dough](#) (1)
- Optional
- [Maker Tape](#) (1)
- Optional
- [Bare Conductive Paint](#) (1)
- Optional

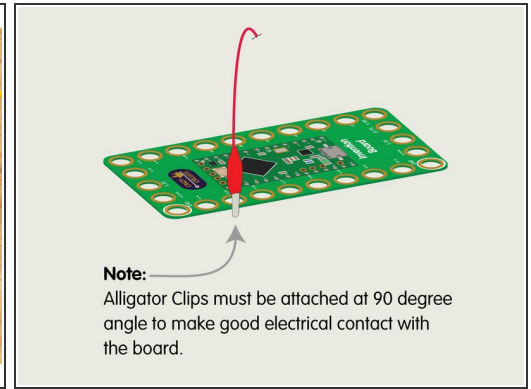
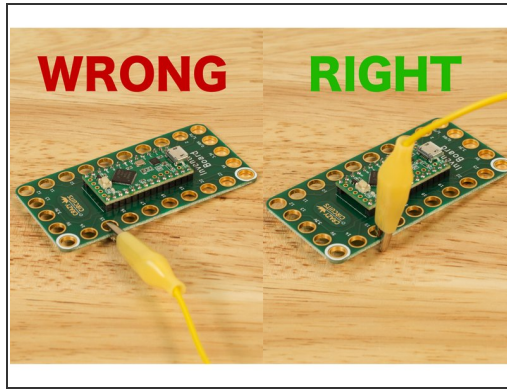
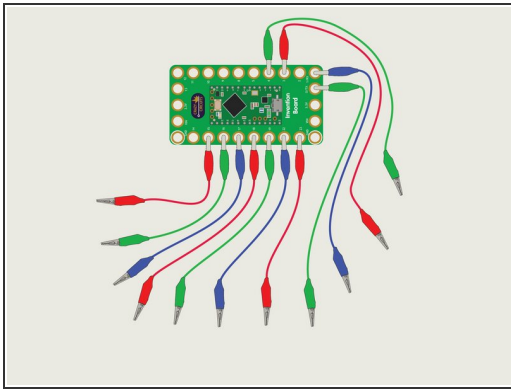
## Step 1 — Let's Get Touchy!



- We're going to build a touch piano. You'll be able to trigger a sound by just touching a conductive surface. For this guide we're going to use Squishy Circuits conductive dough.
- We'll use a browser-based application to play our sounds, so we'll need a computer with internet access and Mozilla Firefox or Google Chrome installed. (Sorry, Safari doesn't seem to work right now!)
- The Crazy Circuits Invention Board can be programmed as a keyboard, and it will then send key commands to the piano application, just like if you were to use a keyboard. (Only much more awesome!)
- Note that since our "piano" send keyboard commands to the computer if you use it when you do not have your web browser loaded up and ready to go with the piano web page, strange things can happen. (Like, phantom typing!)



## Step 2 — Build Your Circuit

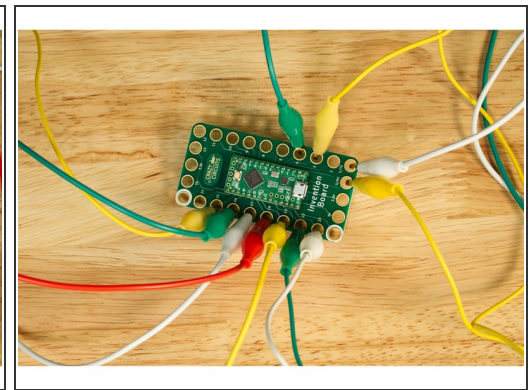
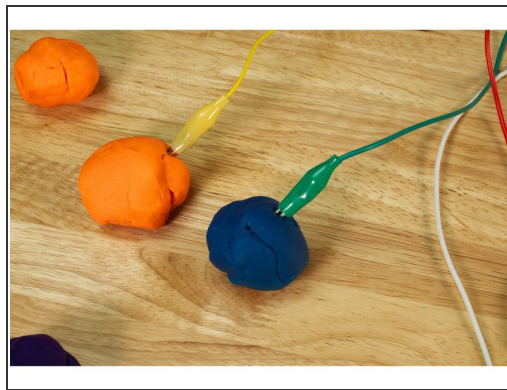
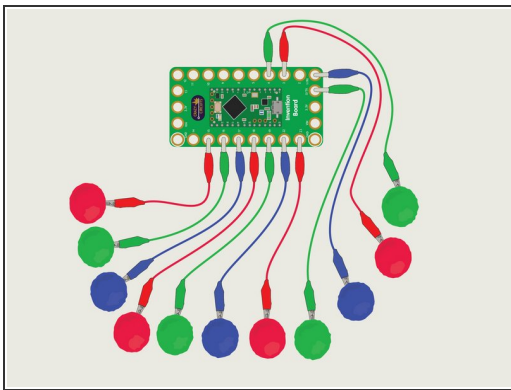


- Our circuit is pretty simple! We're going to connect 11 alligator clips to the Invention Board.

⚠ Note the correct orientation of the alligator clips. They need to be 90 degrees in relation to the board, not flat down.

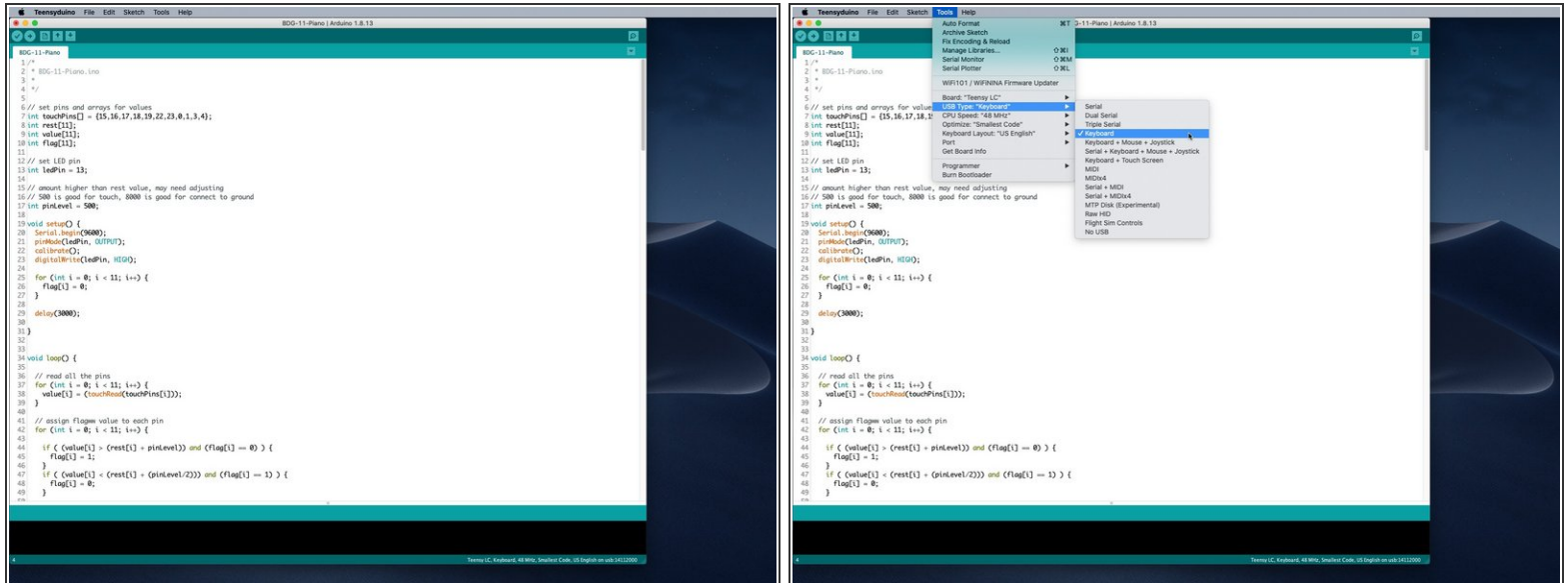
ⓘ You don't have to connect 11 alligator clips (you can do less) but 11 is the maximum you can use.

## Step 3 — Add the Dough



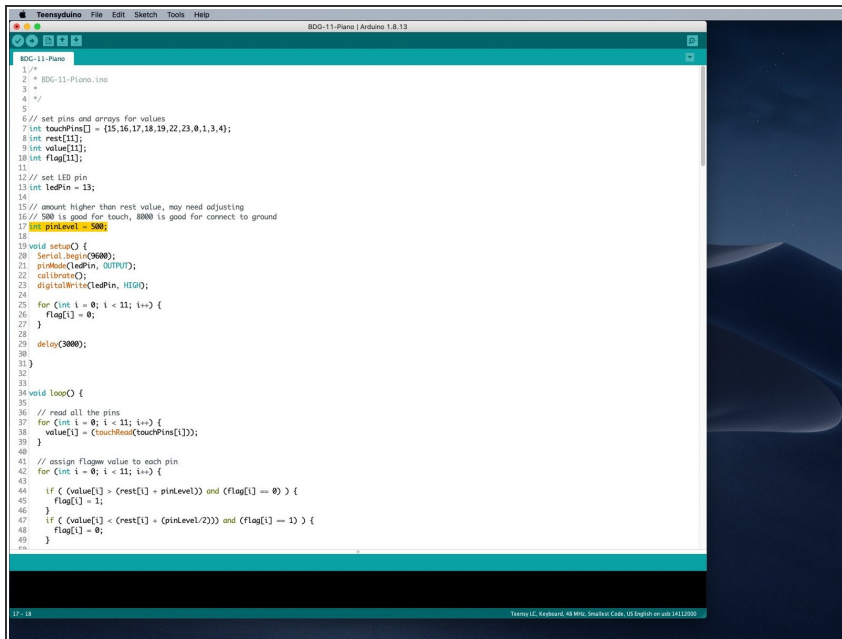
- You should have 11 alligator clips connected to the Invention Board, so it's time to add some dough.
- ⓘ We don't need to add dough, you can just touch the end of the alligator clips, but dough definitely makes a larger target to hit and a bit more fun.
- You don't need to "clip" the dough, just press the metal part into the dough so it's in there securely.

## Step 4 — Program the Invention Board

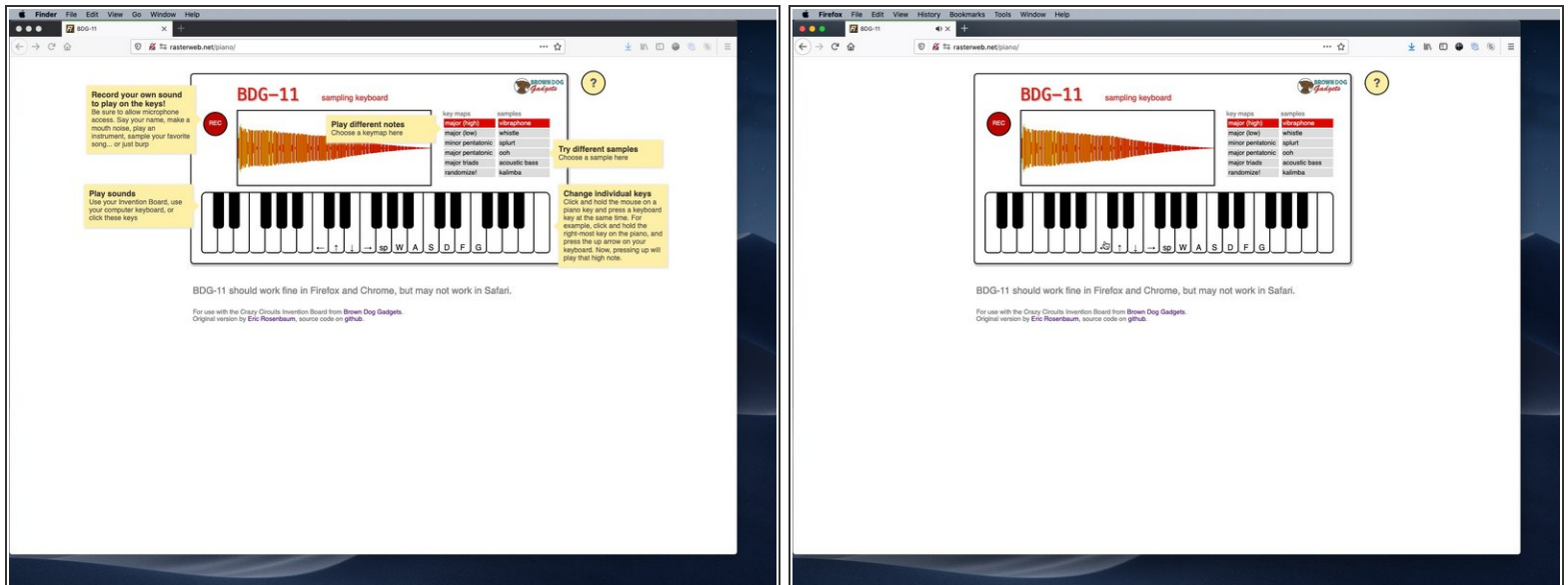


- If you've never programmed the Invention Board before, start with this guide: [Invention Board Setup and Use](#)
- We've got a GitHub repository called [BDG-11 Piano](#) with the Arduino code you'll need.
- 📌 Under the **Tools** menu for **USB Type** make sure you choose **Keyboard**.
- 📌 The Invention Board will send the following characters to the computer: left arrow, up arrow, right arrow, down arrow, space, W, A, S, D, F, and G.
- ⚠️ When you plug the programmed Invention Board into your computer it might start typing right away! Be aware of this as it might type where you don't want it to!

## Step 5 — Calibration and Adjustments



## Step 6 — Load Your Browser



- Using Mozilla Firefox or Google Chrome visit the [BDG-11 Piano](https://rasterweb.net/piano/).
- When the page loads it will show the "help mode" which explains what things are. (You can always see this again by clicking the yellow question mark icon in the upper right corner.)
- First test by either clicking a key with your mouse or using your keyboard. Type one of the arrow keys, the space bar, or the W, A , S, D, F, or G keys.
- If you hear some cool sounds you are ready to go!

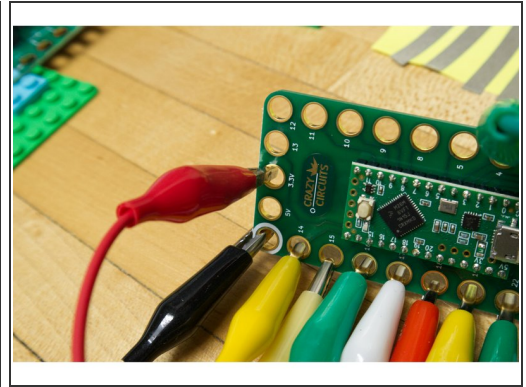
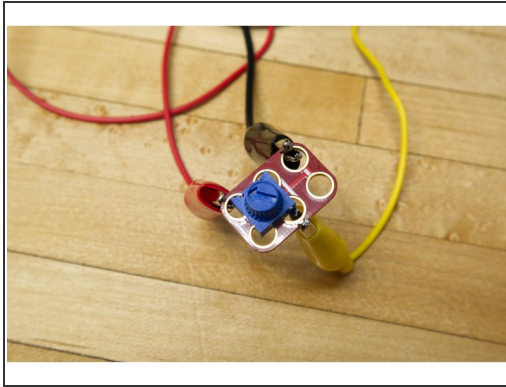
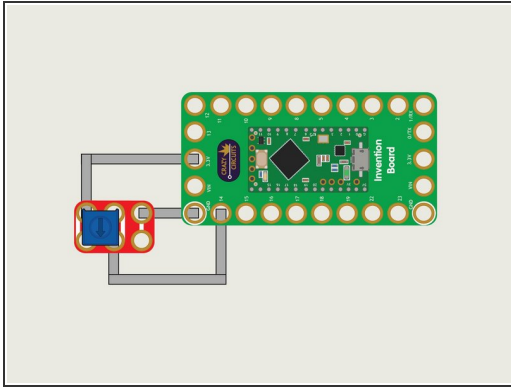
## Step 7 — Test it Out!



- Got your browser loaded up?  
Plugged in your Invention Board?  
Let it calibrate? We're ready to go!
- Hit that dough! Or alligator clips, or  
Maker Tape, or whatever conductive  
material you've got connected.
- Enjoy the smooth (or jarring?)  
sounds of your new piano!

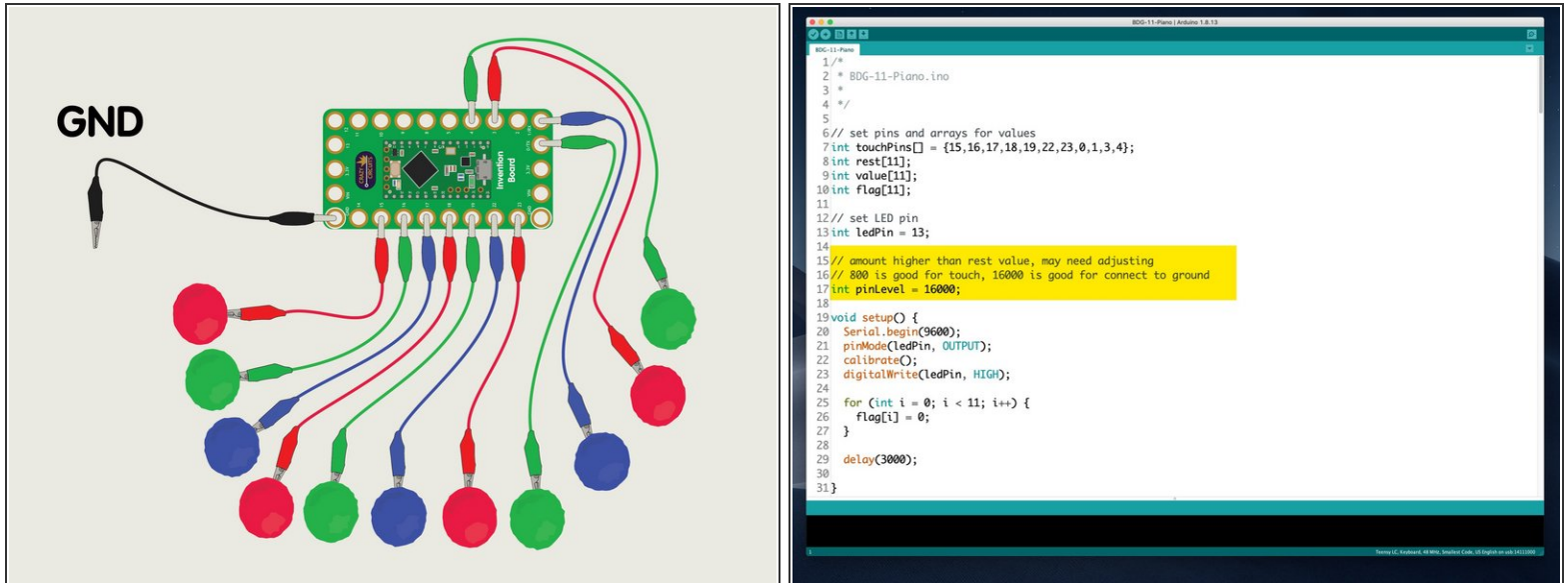


## Step 8 — Make it Adjustable



- We've got a second version of the code called **BDG-11-Piano-Adjustable** in the repo: <https://github.com/BrownDogGadgets/Crazy...>
- To add adjustability you will need three more alligator clips and a [Potentiometer Chip](#).
- If you've got Maker Tape and a LEGO baseplate that's another way to connect the potentiometer. The "center" hole of the potentiometer goes to **Pin 14**, one side goes to **GND** and one side goes to **3.3v**
- The Potentiometer will act as the adjustment dial making the touch sensitivity greater or lesser when you turn in. This can help prevent false triggers when you are not touching the trigger material.

## Step 9 — Use a Ground Connection (Optional)



- If you have issues with the touch aspect of the project you also have the option of using a ground wire.
- The ground wire helps make a more positive connection, but that also means we should raise the **pinLevel** in the code.
- ① It shouldn't take too much effort to get the touch aspect working, but we thought this would be a good alternative if needed.

The image displays two side-by-side screenshots of an Arduino IDE window, showing the compilation of a program for an RDC-11-Piano-Adjustable board.

**Left Screenshot (Source Code):**

- The title bar reads: "RDC-11-Piano-Adjustable | Arduino 1.8.13".
- The code defines a constant `KEY_ERROR_AREA` as 227.
- The `void setup()` function initializes the serial port and prints "RDC-11-Piano-Adjustable".
- The `void loop()` function contains a `while` loop that prints the state of `pinLevel` and then checks for key presses using `Serial.read()`. If a key press is detected, it prints the key value and increments a counter.
- A yellow highlight is placed on the `KEY_ERROR_AREA` constant and the corresponding `Serial.println` statement in the `loop()` function.

**Right Screenshot (Compiled Hex Code):**

- The title bar reads: "HD=16c0d478.fc9.4 | Teensy Keyboard".
- The output shows the compiled hex code for the program, with line numbers corresponding to the source code.
- A yellow highlight is placed on the hex code corresponding to the `KEY_ERROR_AREA` constant and the `Serial.println` statement in the `loop()` function.

- This document was generated on 2023-09-13 08:23:25 AM (MST).