BASIC PROJECTS

HELLO

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BASIC PROJECTS

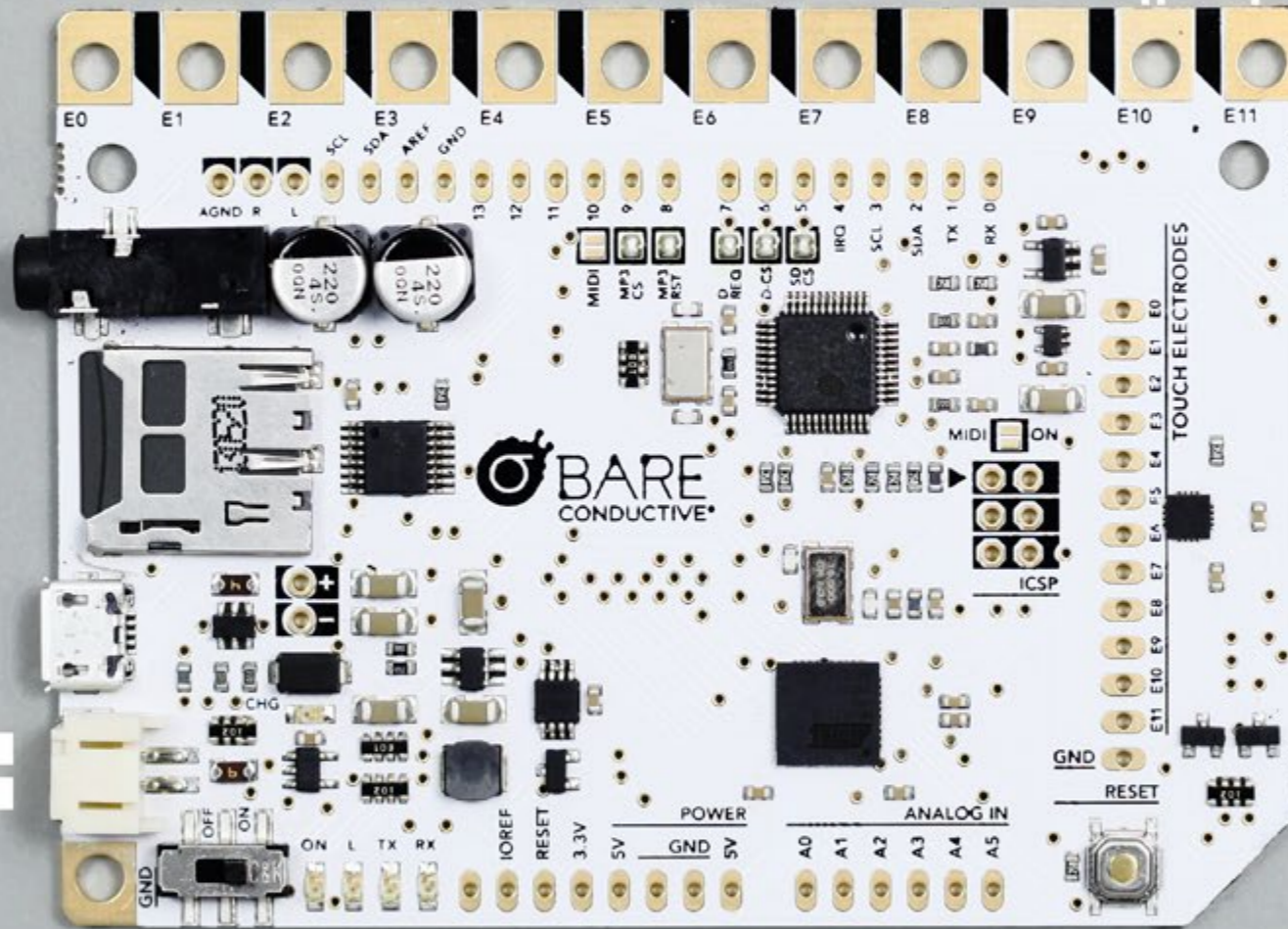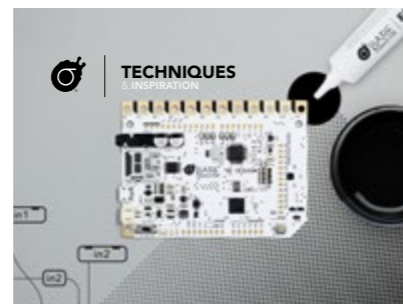WORKSHOP MANUAL   TECHNIQUES & INSPIRATION   BASIC SKILLS   BASIC PROJECTS   DIGITAL TOOLKIT

How to use this document

This document provides three basic project-driven lesson plans using **Electric Paint** and the **Touch Board** to create Musical Objects, Game Controllers and MIDI Pianos. Each project is designed for use by the workshop leader, and comes complete with a Lesson Prep outline, materials list, downloadable templates, video and step-by-step instructions. Use these projects as they are, bulk them up with the **Workshop Manual** resources, or customise the templates to suit your own theme. If you've never used the **Touch Board** or **Electric Paint** before, this is the place to get started.

MUSICAL OBJECTS

With the **Touch Board**, making musical sensors is easy. You can build interaction and sound into your environment by simply exploring the objects and materials around you. Anything conductive can become a sensor when connected to the electrodes on your **Touch Board**, so start experimenting. Load some sounds onto your board, and create a quirky orchestra by connecting everyday objects to the **Touch Board.**

LESSON PREP

The **Musical Object**s project is a quick and fun activity for any beginner group. If you want a computer free lesson, pre load sounds onto the microSD cards, and focus on exploring and connecting objects to learn what is conductive. Build stories from the objects around you.

Computer free workshop

By pre loading microSD cards with sounds you can eliminate the computer from your workshop.

One computer to share

If you want participants to load sounds on the microSD card themselves, you can set up a computer with the sounds in the correct format, so selecting and loading them is easy. A lot of time can be wasted selecting, cropping, and renaming files, so get this out of the way before the workshop.

STEP 1

Load sounds onto microSD cards

Follow the Changing the MP3s tutorial in the Basic Skills document, or do it online:

www.bareconductive.com/make changing-the-mp3s-on-the-micro-sd-card/

If you want to switch sound libraries quickly, you can prepare multiple microSD cards and have each host a different sound collection. Give these to participants to choose from, for example: animals, city sounds, robot sounds etc.

STEP 2

Gather conductive objects

Have a look at the Visual Guide to Conductive Sensors for ideas, or ask each participant to bring along conductive objects.

STEP 3

Print out or share pdf

Share the step-by-step instructions with participants, you can print these, adapt them to your lesson template or share them on screen in the classroom.

PREP MATERIALS

Touch Boards
MicroSD card reader
MicroSD cards
Mini speaker or headphones
Micro USB cable
Conductive objects
Alligator clips
Internet connection
PC

LESSON MATERIALS

Touch Boards
MicroSD cards with sounds
Conductive objects

3 participants per 1 Touch Board
1 – 4 objects per participant
1 MicroSD card per Touch Board

SCHEDULE

Refer to the Workshop Manual for suggested time schedules for different length of workshops. This Basic Project lends itself well to a 45 minute workshop.

STEP 1
CHOOSE OBJECTS

To begin, select the objects you want to make interactive. You can explore which objects are conductive by attaching them to the Touch Board with alligator clips and touching them.

If the object you'd like to use isn't metallic or conductive, you can create a conductive touch point yourself. Do this by painting the object with Electric Paint, or inserting something conductive to make contact.

Electric Paint is water soluble so it is easy to remove, but it can permanently stain certain materials so take care if applying it to fabrics or other porous materials.
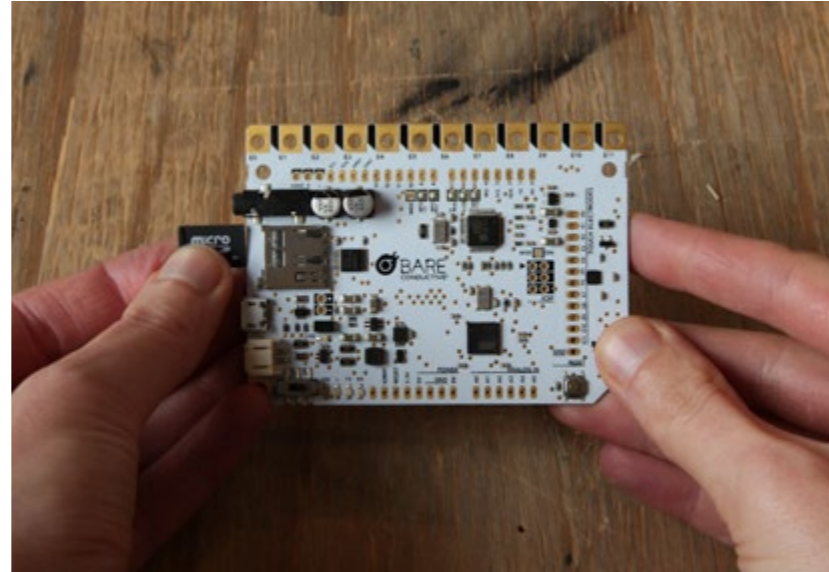
STEP 2
LOAD SOUNDS

Insert the preloaded microSD card into the Touch Board.
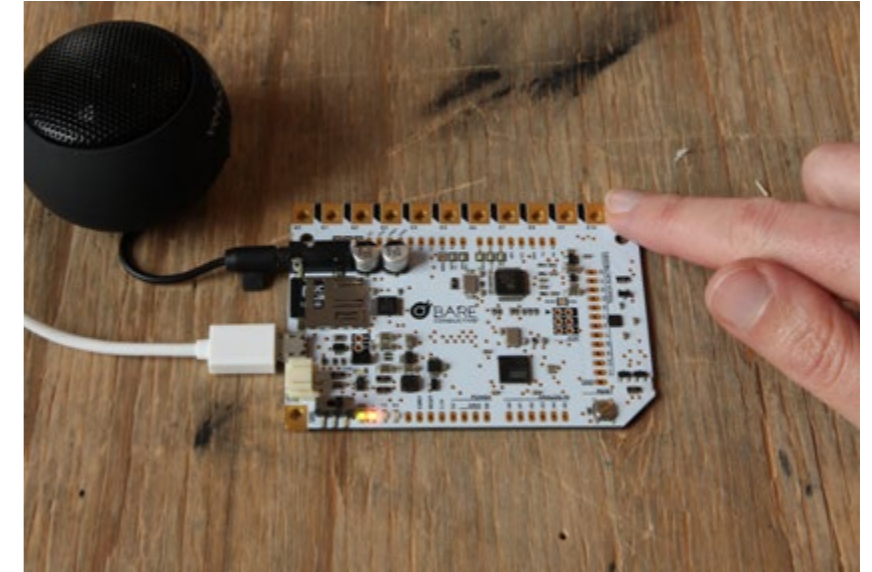
STEP 3
AUDIO, POWER AND TESTING

Rest the Touch Board on a non conductive surface. If there is metal around the Touch Board it may disrupt the sensors.

Plug in your speaker or headphones and Micro USB Cable for power. You can use a mains socket or a computer USB.

Turn on your Touch Board using the switch on the lower left hand side of the board. Now touch each electrode to check all the sounds are working.
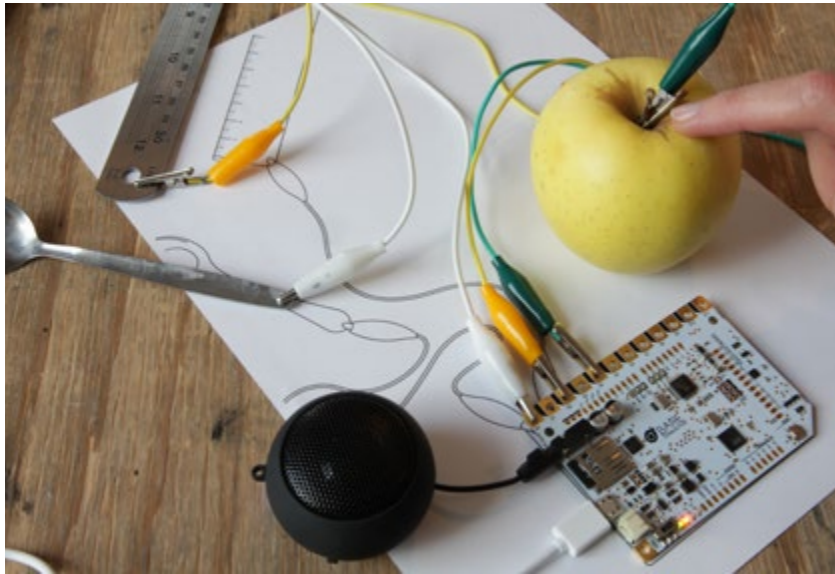
STEP 4
ATTACH OBJECTS

Connect one end of the alligator clips to the objects you've selected and the other to the one of the electrodes on the Touch Board. Ensure all connections are secure and the sensors are not touching each other. Use the reset button on the lower right hand side of the Touch Board to recalibrate the board once you've connected all the objects.
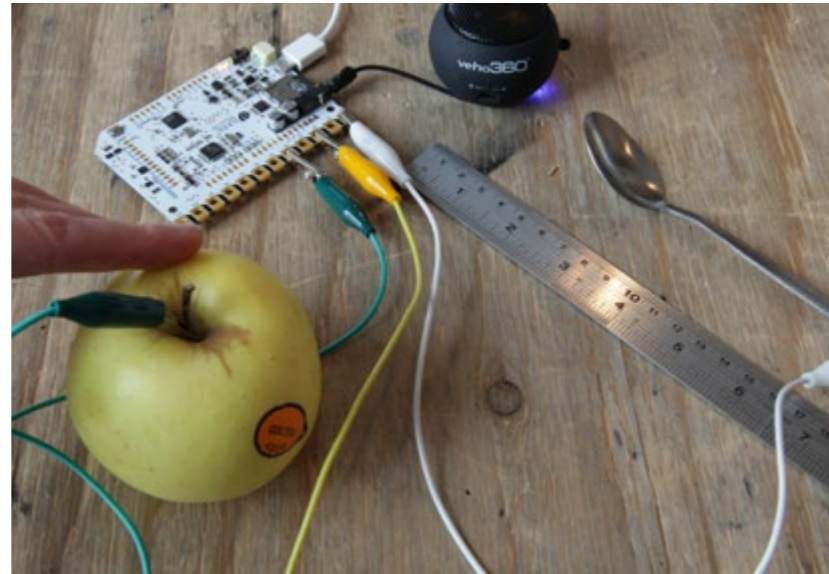
STEP 5
TRIGGER YOUR SENSORS

Touch the objects you've connected to trigger your sounds. Swap the objects around and test which ones work and which don't. Use the visual diagrams in the Workshop Manual to explain how the sensors are working and why some objects work while others don't.
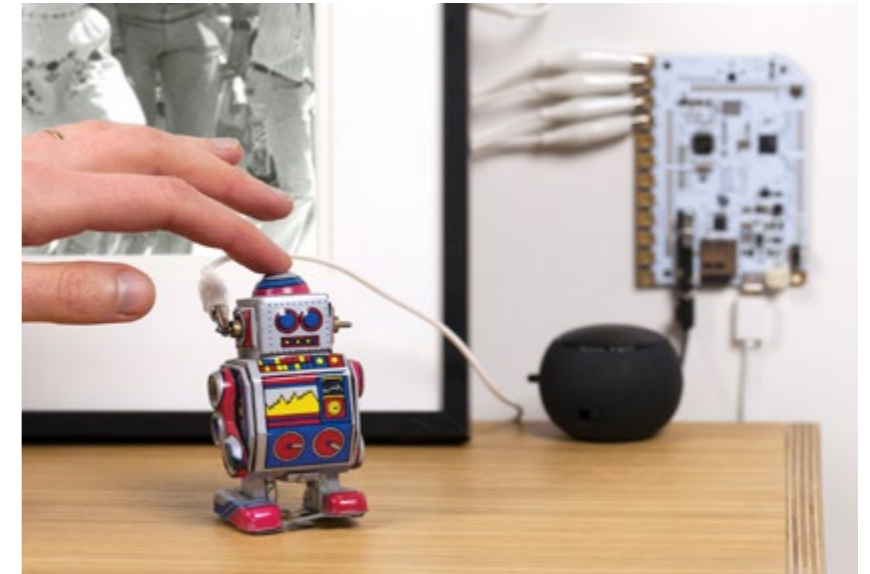
STEP 6
CREATE STORIES

What stories can be made from the objects and sounds you have chosen? Use the objects to play a song, make a mini-orchestra or organise them to tell a story or create a physical narrative timeline.
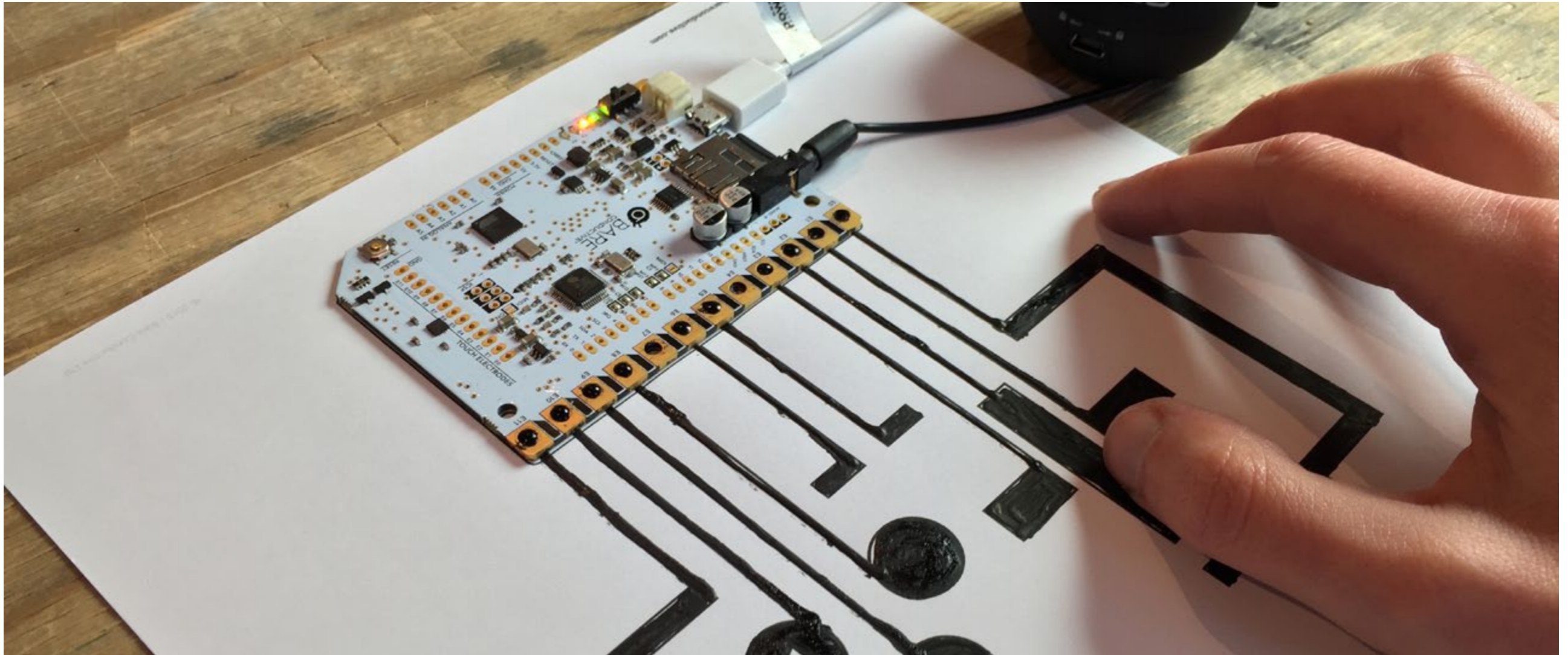
GAME CONTROLLER

This project uses Electric Paint and the Touch Board to create a quick retro game controller to trigger sounds. Use the template provided to paint an interface, or let participants design their own. Select and load MP3s, connect the Touch Board, and play. This is a great project to introduce the basic principles behind conductive paint, and to start an exploration into custom interfaces.

LESSON PREP

Like Musical Objects, the **Game Controller** activity uses the Touch Board in its original Touch MP3 mode. To keep the lesson focused on the interface design and how the technology works, we suggest you select and load the MP3 files prior to the workshop.

Computer free workshop
By selecting and pre loading sounds on the microSD cards you can run this workshop computer free.

One computer to share
A lot of time can be wasted adjusting and re saving audio files. If you want participants to load sounds on the microSD card themselves, select the files beforehand, and set up a computer with the files saved with the correct naming convention. This way participants can focus on selecting and loading sounds rather than on editing MP3s.

STEP 1

Load sounds onto microSD cards

Follow the Changing the MP3s tutorial in the Basic Skills document, or do it online:

www.bareconductive.com/make/ changing-the-mp3s-on-the-micro-sd-card/

If you want to switch sound libraries quickly, you can prepare multiple microSD cards and have each host a different sound collection. Give these to participants to choose from, for example: animals, city sounds, robot sounds etc.

STEP 2

Print out or share pdf

Share the step-by-step instructions with each participant. These can be printed out, adapted into your lesson template or shared on screen in the classroom.

STEP 3

Print out the template on card

This project requires one Touch Board per template. It's best to print or photocopy the template. Another option is to use the vector file to cut out a stencil.

Make sure to use heavy paper stock — at least 200gsm — so the paper won't warp when you coat it with Electric Paint.


PREP MATERIALS

Touch Board
Mini speaker or headphones
Micro USB cable
Electric Paint
Internet connection
PC

LESSON MATERIALS

MicroSD cards with sounds
Electric Paint 10ml Tubes
Electric Paint 50ml Jars
Paint brushes
Game Controller templates or stencils
3 participants per 1 Touch Board

SCHEDULE

Refer to the Workshop Manual for suggested time schedules for different types of workshops. This Basic Project lends itself well to a 45 minutes workshop.
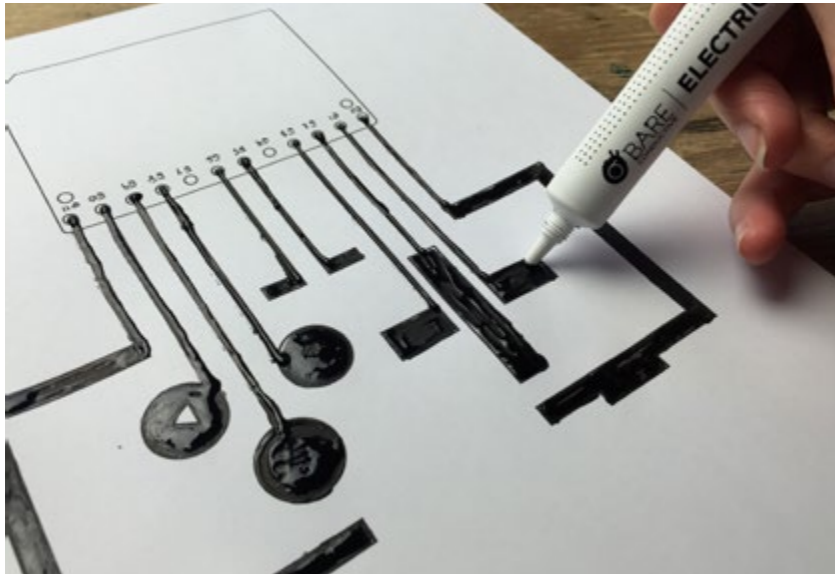
STEP 1
PAINT THE INTERFACE

Use Electric Paint to paint the game controller graphic on your paper template. The graphic is there as a guide, but you can also create your own designs as long as your sensor lines do not cross or touch.
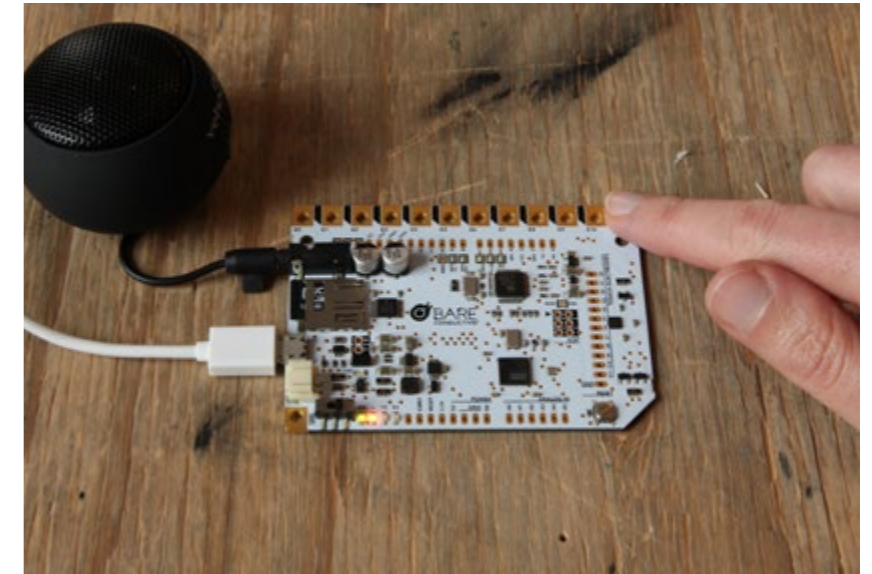
Electric Paint takes about 15 minutes to dry at room temperature.

Use this time to select sounds, or review the Capacitive Sensing diagrams from the Workshop Manual to understand how the sensors are working.
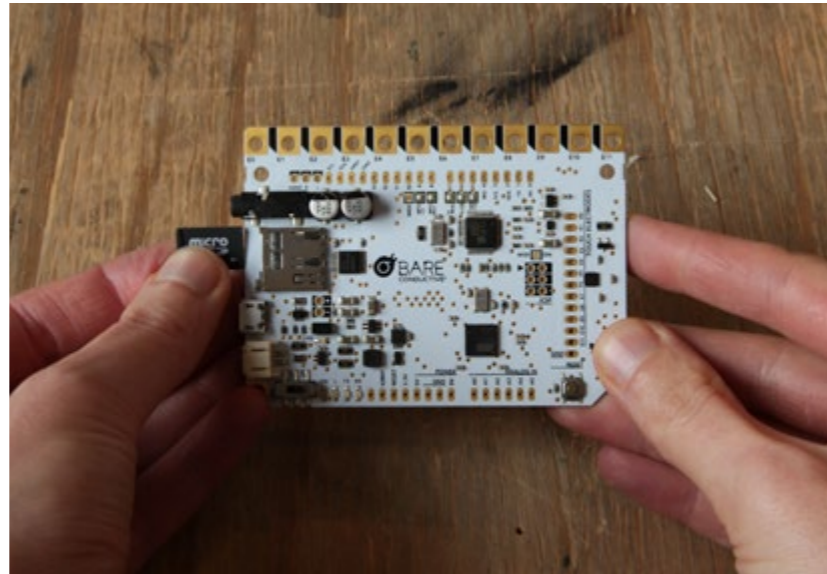
STEP 2
LOAD SOUNDS

Once you've selected your sounds, introduce the microSD card into the Touch Board.

STEP 3
AUDIO, POWER AND TESTING

Rest the Touch Board on a non conductive surface. If there is metal around the Touch Board it may disrupt the sensors.

Plug in your speaker or headphones and Micro USB Cable for power. You can use a mains socket or a computer USB.

Turn on your Touch Board using the switch on the lower left hand side of the board. Now touch each electrode to check all the sounds are working. Make sure to note which sound is mapped to which electrode.
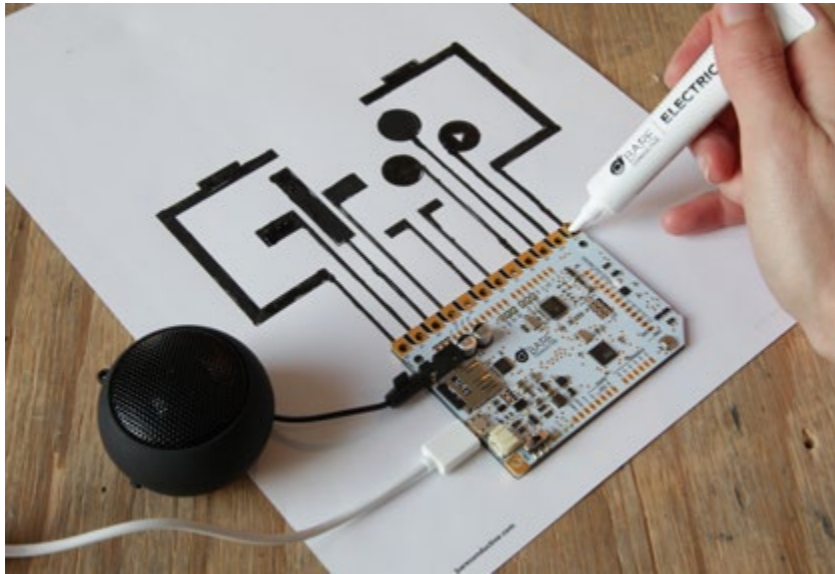
STEP 4
ATTACH TOUCH BOARD TO PAPER

Ensure the graphic you painted is dry. Squeeze a small droplet of paint onto the circles at the bottom of your template. Carefully centre the Touch Board over your grid, and place it down so that each electrode makes contact with the droplet below. Squeeze a second set of droplets on the top of your electrodes. You don't need to cover them, only to connect to the paint beneath.

Make sure no paint bridges between the electrodes as this will cause a short circuit.

This method of attaching the Touch Board to paper is called 'cold soldering'. Check out the Basic Skills document for a detailed tutorial and troubleshooting on this technique.
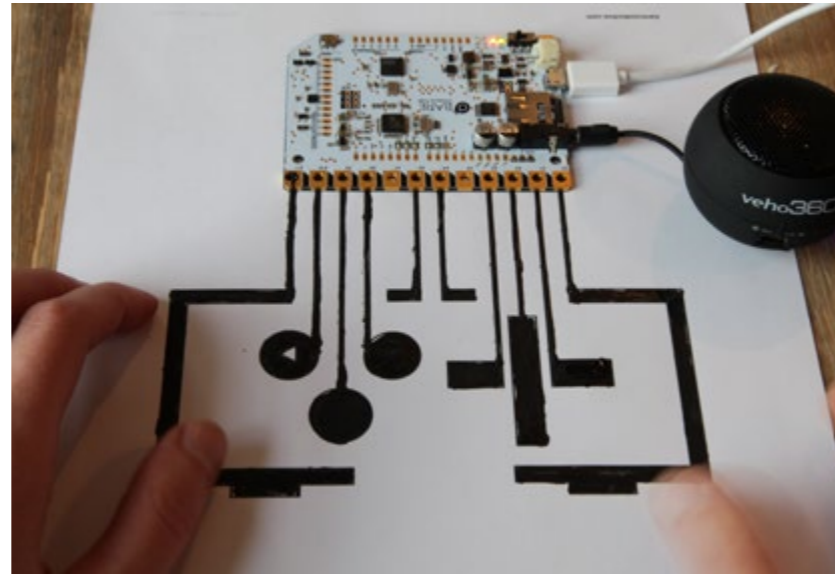
STEP 5
TRIGGER SOUNDS TO CREATE STORIES

Once your solder is completely dry, the graphic sensors are ready to use. Test that everything is working by turning on the Touch Board and touching each of the painted sensors. Your game controller should trigger the sounds you selected.

If any of the sensors aren't working, make sure the connection to the paint is robust, and that you don't have a short circuit beneath the electrodes. Now play away!
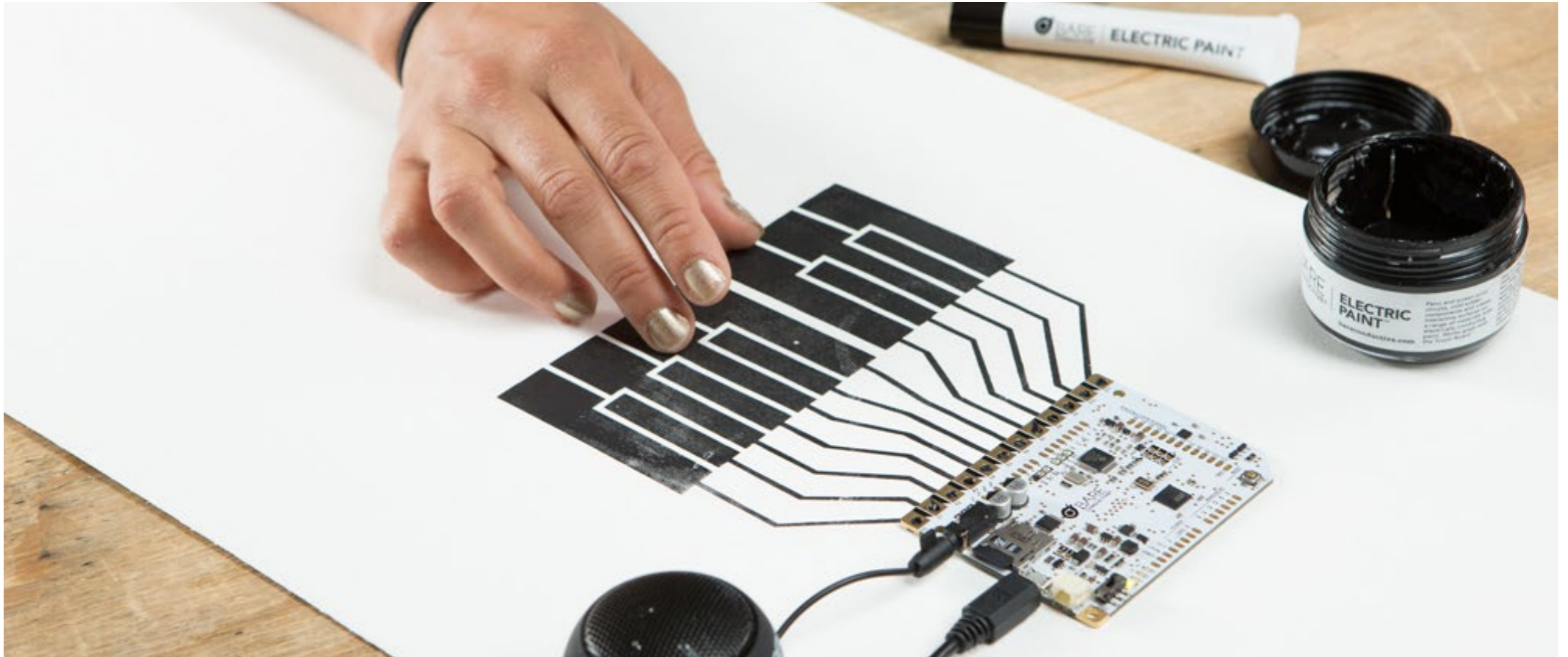
MIDI PIANO

You can use the Touch Board in MIDI mode to simulate instruments. This project shows you how to use the Touch Board in MIDI mode to run a paper piano workshop. The Touch Board has a powerful MP3 chip that can read MIDI notes from its on board library. In MIDI mode, the board is capable of playing multiple samples simultaneously. Just make some small physical changes to the board, load the MIDI code and get participants playing on paper pianos.

LESSON PREP

The outcome of this easy **MIDI Piano** project is to create a working paper piano using Electric Paint and the Touch Board. This activity will consist of painting the conductive interface, attaching the Touch Board, resetting the board and playing.

Computer free workshop
You can make this a computer-free workshop by preparing and programming the Touch Boards for on board MIDI in advance.

Programming
If you want the participants themselves to upload the code just plan to include Step 1 in your lesson.

What is MIDI
Refer to the Workshop Manual for a visual diagram and explanation on MIDI.

Waiting for the paint to dry
Electric Paint takes about 15 minutes to dry. Plan this time into the workshop and take the opportunity to explain how the technology is working. Refer to the Workshop Manual for visual diagrams and explanations on both MIDI and Capacitive Sensing.

STEP 1

Prepare all the Touch Boards for on board MIDI mode

To begin, follow this step-by-step tutorial online:

www.bareconductive.com/make/on-board-midi-mode/

This will show you how to cold solder the correct pins on your Touch Board and how to upload the MIDI code.

STEP 2

Print out or share pdf

Share the step-by-step instructions with each participant. These can be printed out, adapted into your lesson template or shared on screen in the classroom.

STEP 3

Print out the template on card

This project requires one Touch Board per template. It's best to print or photocopy the template. Another option is to use the vector file to cut out a stencil.

Make sure to use heavy paper stock — at least 200gsm — so the paper won't warp when you coat it with Electric Paint.


PREP MATERIALS

Touch Board
Mini speaker or headphones
Micro USB cable
Electric Paint
Internet connection
PC

LESSON MATERIALS

Touch Boards prepared for MIDI
Electric Paint 10ml Tubes
Electric Paint 50ml Jars
Paint brushes
Piano templates or stencils
3 participants per 1 Touch Board

SCHEDULE

Refer to the Workshop Manual for suggested time schedules for different types of workshops. This Basic Project lends itself well to a 45 minutes workshop.
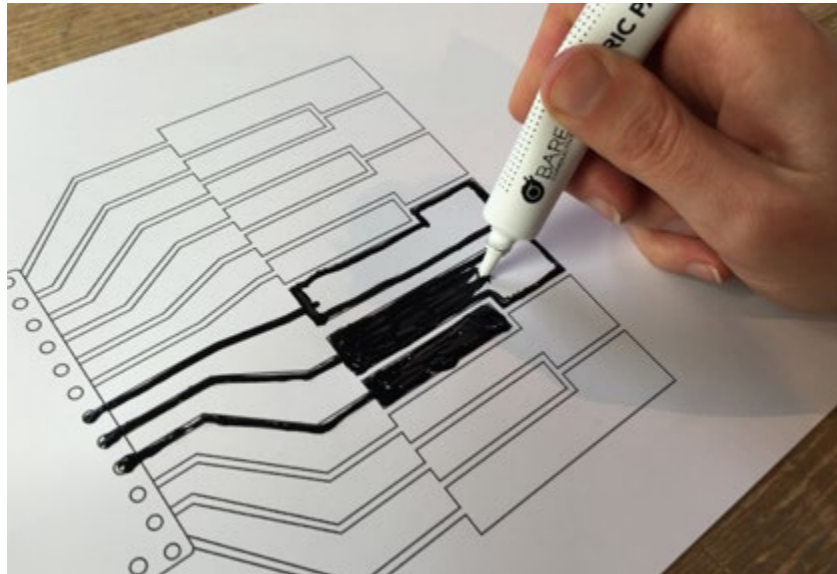
STEP 1
PAINT THE PIANO GRAPHIC

Use Electric Paint to fill in the conductive piano graphic on the paper template. You can use the tube directly, or paint it with a brush. Make sure that the piano keys don't touch each other or they won't play.

Electric Paint takes about 15 minutes to dry, so wait patiently before attaching the Touch Board.

Use this time to review the Capacitive Sensing diagrams from the Workshop Manual to understand how the sensors are working.
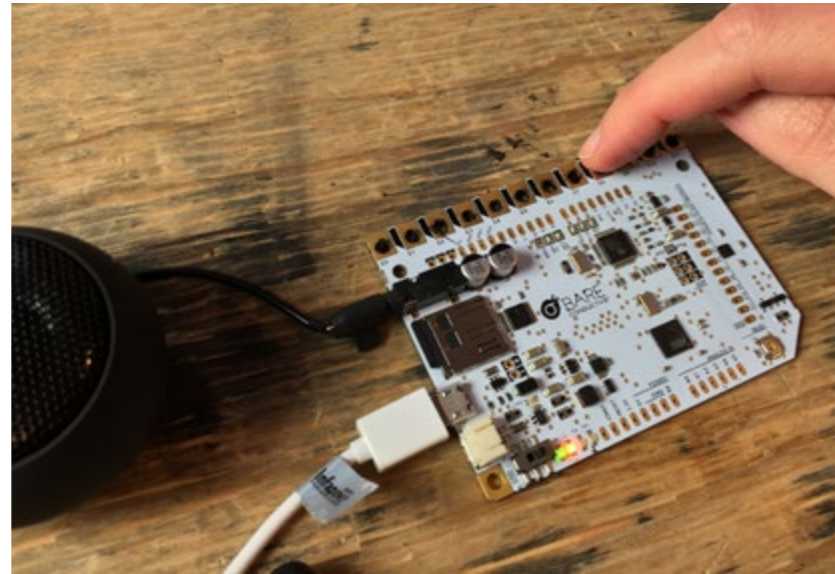
STEP 3
AUDIO, POWER AND TESTING

Rest the Touch Board on a non conductive surface. If there is metal around the Touch Board it may disrupt the sensors.

Plug in your speaker or headphones and Micro USB Cable for power. You can use a mains socket or a computer USB.

Turn on your Touch Board using the switch on the lower left hand side of the board. Touch each of the electrodes to test they're all working.
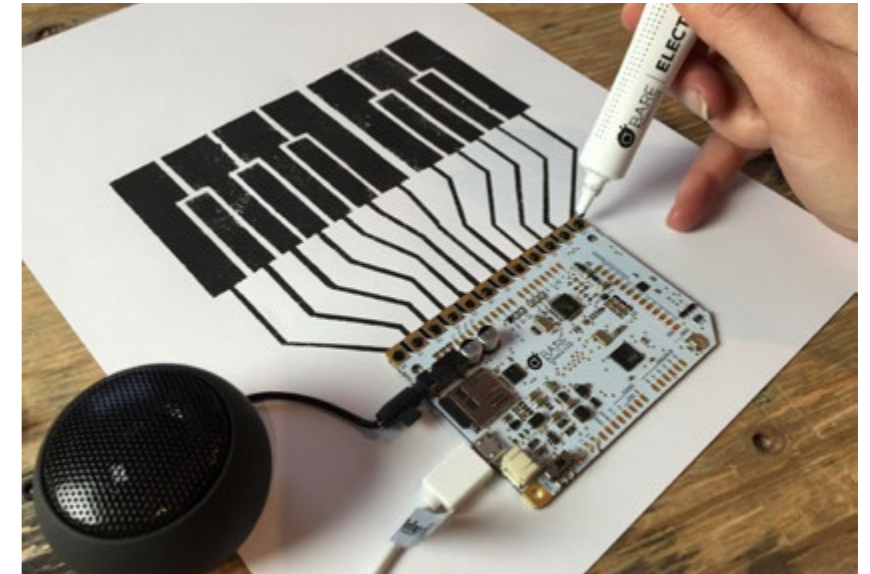
STEP 4
ATTACH TOUCH BOARD TO PAPER

Squeeze a small droplet of paint onto each of the circles at the bottom of your template. Carefully centre the Touch Board over your grid, and place it down so that each electrode makes contact with the droplet below. Squeeze a second set of droplets on the top of your electrodes. You don't need to cover them, only to connect to the paint beneath.

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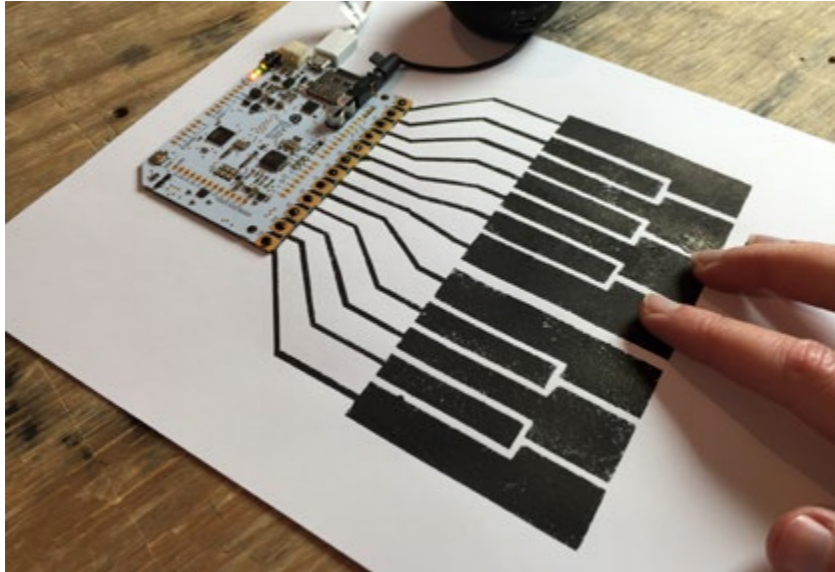
STEP 5
PLUG AND PLAY

Wait 5 – 10 minutes to make sure the paint is totally dry and to ensure the board won't slide and smudge.

Plug in your battery or power supply and connect your speaker or headphones once again. Now you can play a tune with your awesome paper keys!

If any of the sensors aren't working, make sure the connection to the paint is robust, and that you don't have a short circuit beneath the electrodes.

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