

Drawing Machine with Scratch and Makey Makey

Aims

The aims of the activity are for children to:

1. Tinker with a computer program made with Scratch. The program will draw and make marks to develop creativity and computational thinking skills and enable them to learn about aspects of programming.
2. Create a console that will interact with the program using Makey Makey to learn construction skills, enable children to learn about conductive materials and about how computer programs can communicate with electronics.

Intended Learning Objectives

All children will be able to:

- control (either collaboratively or alone) a program that draws;
- create a basic gaming console using conductive materials interacting with Makey Makey.

Some children will be able to:

- tinker with some of the code to create different drawings;
- modify the gaming console to include more options;
- remix and reimagine this project to create new ways of drawing.

Activity

Introduction

This activity is designed for use in an open exploration space such as a library or gallery. Prepare the tinkering station with parcel paper for a visual guide for participants. (Tip: A large workshop table invites collaboration and conversation - if possible allow for both standing and seating at the station.)

Plan for inquiry and tinkering by having all materials laid out in an open workshop format. Create a short guide to the activity including short instructions for DIY gamer console.

Use the table as a working tool to document the process and encourage participants to write down questions, draw diagrams and make notes.

Allow children to tinker with the drawing machine before formal activity begins. This will allow them to experiment with the interactivity of the physical materials with the drawing program.

Prerequisites for educators

- Some knowledge of Scratch Programming language: <https://scratch.mit.edu/educators/>
- Scratch account enabled to save projects: https://en.scratch-wiki.info/wiki/Creating_an_Account
- How to connect a Makey Makey to a computer: <https://makeymakey.com/how-to/classic/>

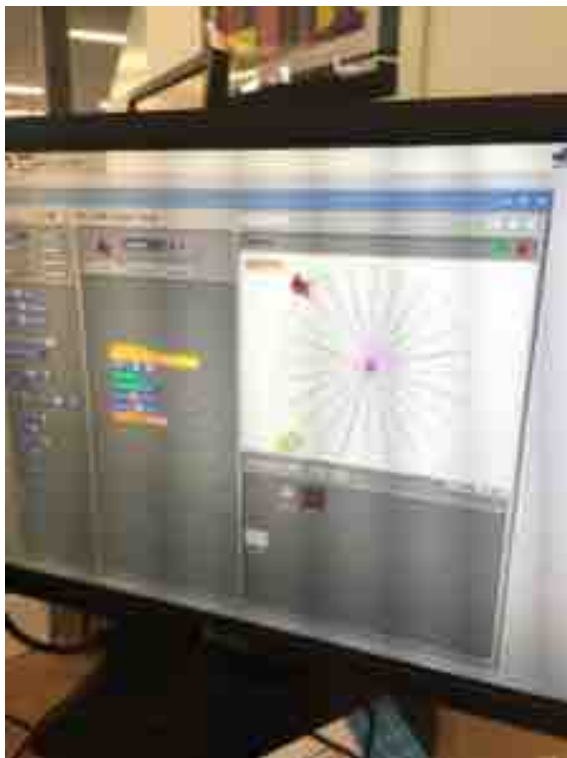
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1. Introduce children to the Computer, Scratch program, Makey Makey and DIY gaming console with a demo (if some have discovered how to 'draw' in their initial exploration - let them demonstrate).
2. Relate this example to the visual guide.
3. Encourage experimentation with the DIY gaming console - remember to ask 'What if...?'
4. Encourage experimentation with some part of the code beginning with number values.
5. Allow children to start organically to tinker with their machine - naming them can be fun to begin modifications based on the name.
6. Demonstrate how to take a 'screen grab' of their drawings for a future gallery of digital art.

Useful links: The following link contains Scratch projects to explore drawing machines

<https://scratch.mit.edu/studios/5060196/>

Begin with this project <https://scratch.mit.edu/projects/220378178/> with included guide



Two sprites draw programmes to create different effects



Interaction with Makey Makey DIY console

Materials

- Playdough or DIY salt dough
- Recyclable craft materials that can be found at home: corks, paper clips, google eyes, bbq sticks, aluminium pie cases, aluminium foil.
- Parcel paper or large roll of paper for visual guide
- Masking tape
- Makey Makey with crocodile clips
- Glue sticks
- Scissors

Preparation

- Table covering and visual guide
- Computer running Scratch with drawing program pre programmed (see link)
- DIY console connected to Makey Makey controlling drawing machine
- Tools
- Computer running Scratch e.g. Raspberry Pi (Can be online or offline)

Glossary

Console: a human interaction device used for controlling an electronic game or otherwise

Tinkering: experimentation through trial and error often by combining seemingly random materials and ideas together. Tinkers use, 'What if I...?' when making.

Makey Makey: is an electronic invention tool that allows users to connect everyday objects to computer programs. It uses closed loop electrical signals to send the computer either a keyboard stroke or mouse click signal.

Scratch: is a free programming language and online community where you can create your own interactive stories, games, and animations.

Further Reading

Lifelong Kindergarten and Mitch Resnick: Founder of Scratch

<http://lifelongkindergarten.net/>

<https://www.edutopia.org/article/future-coding-schools>

Notes prepared by Mark Shilltoe - <https://about.me/markshilltoe>