Afterschool Alliance

Tools, ideas, and strategies for creative computing in afterschool

December 6, 2017

Agenda

1. Defining Computing
2. SciGirls Code approach
3. Family Creative Learning approach
4. Audience Q&A

Speakers

Sarah Carter

Manager STEM
Media & Education
SciGirls

Ricarose Roque

Assistant Professor
University of Colorado, Boulder

Melissa Ballard

STEM Manager
Afterschool Alliance

Technology

Coding

Computer Science

Programming

Digital Learning

Media Literacy

Computing

Computational Thinking

STEM-C

Tech Skills

SciGirls

SciGirls Code:

A National Connected Learning Model to Integrate Computing in STEM Learning with Middle School Girls

NSF STEM + C

TWIN CITIES PBS

SciGirls Code

Partnership Model & Project Team

SciGirls

Joan Freese
Rita Karl

National Girls Collaborative Project

Karen Peterson

LT media.lab

Cassie Scharber, PhD

SciGirls Code

More Project Team

Sarah Carter

Leah Defenbaugh

Katie Hessen

Heather Benedict

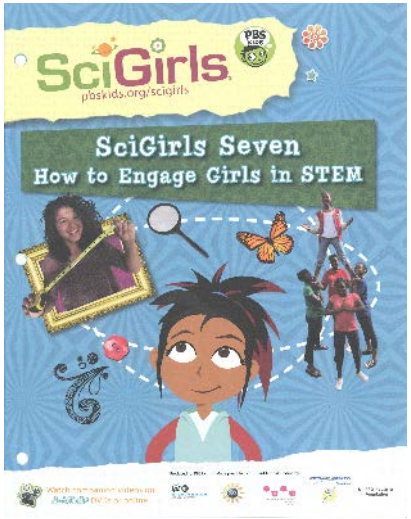
SciGirls Code

Project Goals

1. Spark and strengthen girls' interest, skills, and confidence as technology creators.
2. Train educators and role models in best practices for engaging girls.
3. Research computational thinking and the connected learning model for out of school CS learning.

The SciGirls Seven

Research based gender equity strategies



"To change how millions of girls (ages 8-13) think about STEM"

The SciGirls Seven

ONE. Girls benefit from collaboration, especially when they can participate and communicate fairly. (Parker & Rennie, 2002; Fancsali, 2002)

TWO. Girls are motivated by projects they find personally relevant and meaningful. (Eisenhart & Finkel, 1998; Thompson & Windschitl, 2005; Liston, Peterson, & Ragan, 2008)

The SciGirls Seven

THREE. Girls enjoy hands-on, open-ended projects and investigations. (Chatman, Nielsen, Strauss, & Tanner, 2008; Burkam, Lee, & Smerdon,1997; Fanscali, 2002)

FOUR. Girls are motivated when they can approach projects in their own way, applying their creativity and unique talents. (Eisenhart & Finkel,1998; Calabrese Barton, Tan, & Rivet, 2008)

SciGirls Seven

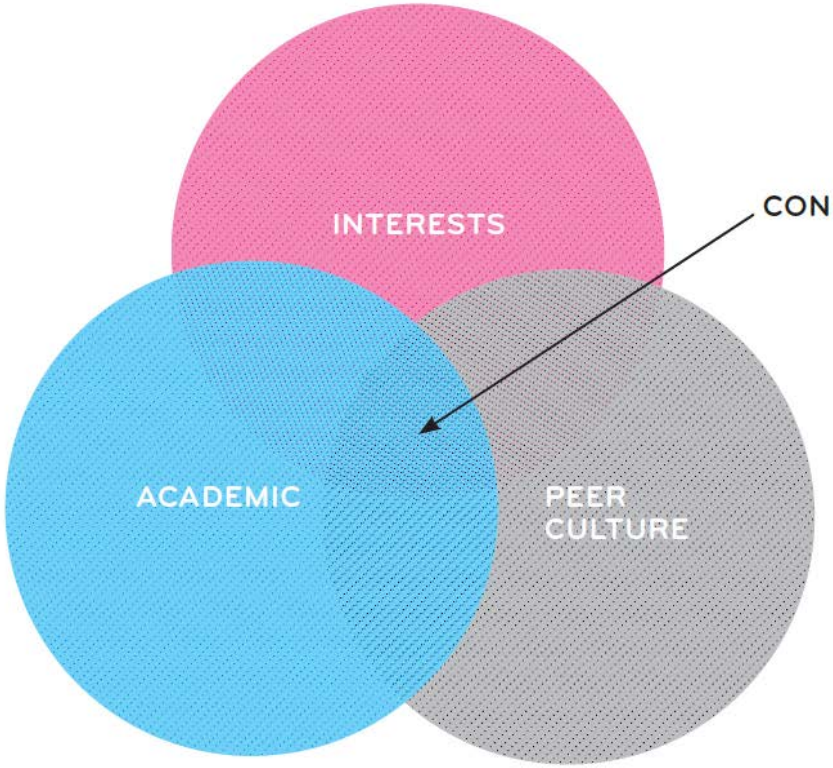
FIVE: Girls' confidence and performance improves in response to specific, positive feedback on things they can control – such as effort, strategies and behaviors. (Halpern, et al., 2007; Zeldin & Pajares, 2000; Blackwell, Trzesniewski, & Sorich Dweck, 2007; Mueller & Dweck, 1998)

SIX: Girls gain confidence and trust in their own reasoning when encouraged to think critically. (Chatman, et al., 2008; Eisenhart & Finkel,1998)

SEVEN: Girls benefit from relationships with role models and mentors. (Liston, et al., 2008; Evans, Whigham, & Wang, 1995)

Connected Learning

Integrates three spheres of learning



FLIPGRID.

Computational Thinking

Perspectives: a particular attitude toward or way of regarding something, a point of view

- Expressing
- Connecting
- Questioning

Practices: the actual application or use of an idea, belief, or methods

- Experimenting and Iterating
- Testing and Debugging
- Reusing and Remixing
- Abstracting and Modularizing

Concepts: abstract ideas

- Sequence
- Loops
- Parallelism
- Events
- Conditionals
- Operators
- Data

SciGirls Code

Content Criteria

- Open Ended
- Existing/Adaptable curriculum
- Robust User/Learning community
- Possibility for browser based or mobile development environment

Computational Thinking/Unplugged Activities

Options

CODE

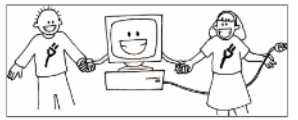
CREATIVE COMPUTING

Made w/ Code Google

A High-School Curriculum Exploring What Computer Science Is and What It Can Do

ECS EXPLORING COMPUTER SCIENCE

CS UNPLUGGED



An enrichment and extension programme for primary-aged students

Created by

Tim Bell, Ian H. Witten and Mike Fellows

Adapted for classroom use by Robyn Adams and Jane McKenzie

Illustrations by Matt Powell

2015 Revision by Sam Jarman

technovation

SciGirls PBS KIDS

tpt TWIN CITIES PBS

Location Based Augmented Reality

Platform Options

Taleblazer

MIT AppInventor

Thunkable

Robotics

Platform Options

Sphero SPRK+

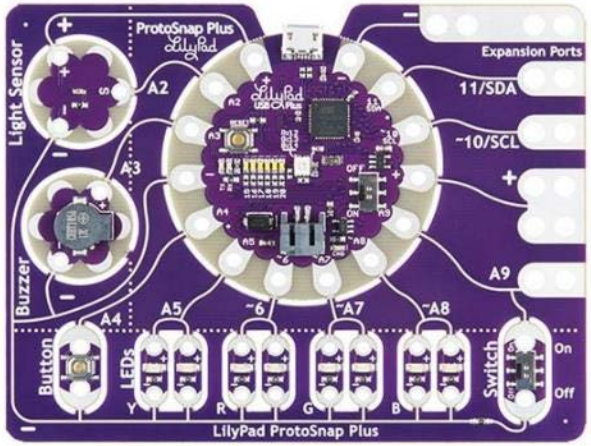
Hummingbird Duo

Ozobot Bits

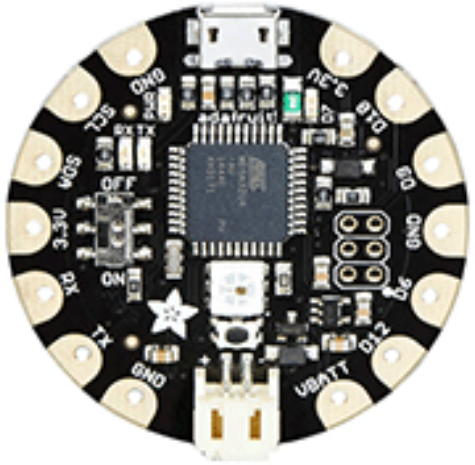
E-Textiles/ Wearables

Platform Options

Chibitronics

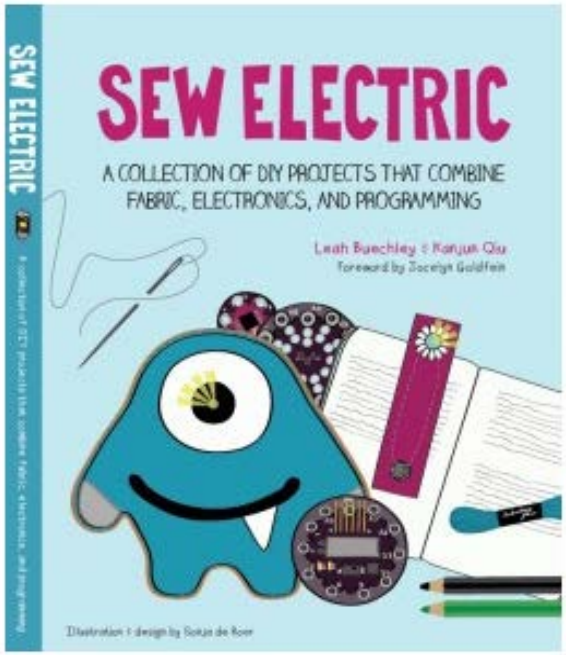


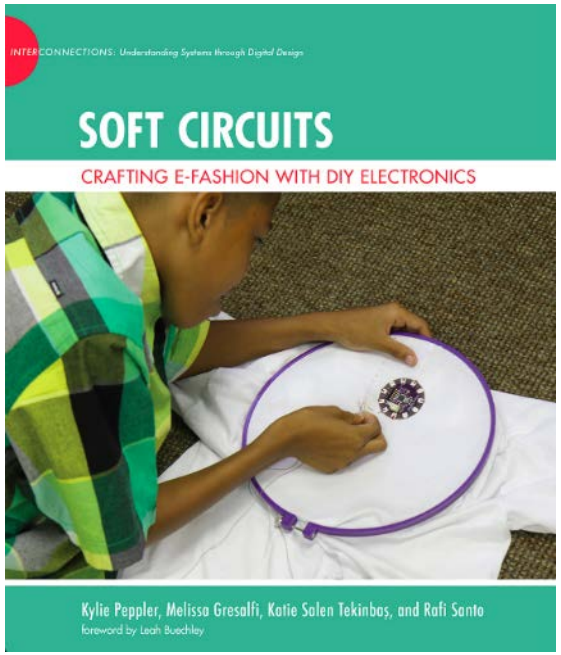
Lilypad Arduino



Adafruit Flora

Curriculum - Starting Points







Family Creative Learning

Engaging Children and Parents as Computational Creators

Ricarose Roque
Information Science
University of Colorado, Boulder


WORKSHOP
TINKER HERE

When children learn to sew, they can create a variety of meaningful artifacts as well as access a rich history and tradition of sewing that spans generations and crosses social groups.

With the example of sewing in mind, let’s think of ways to leverage social support from families and communities.

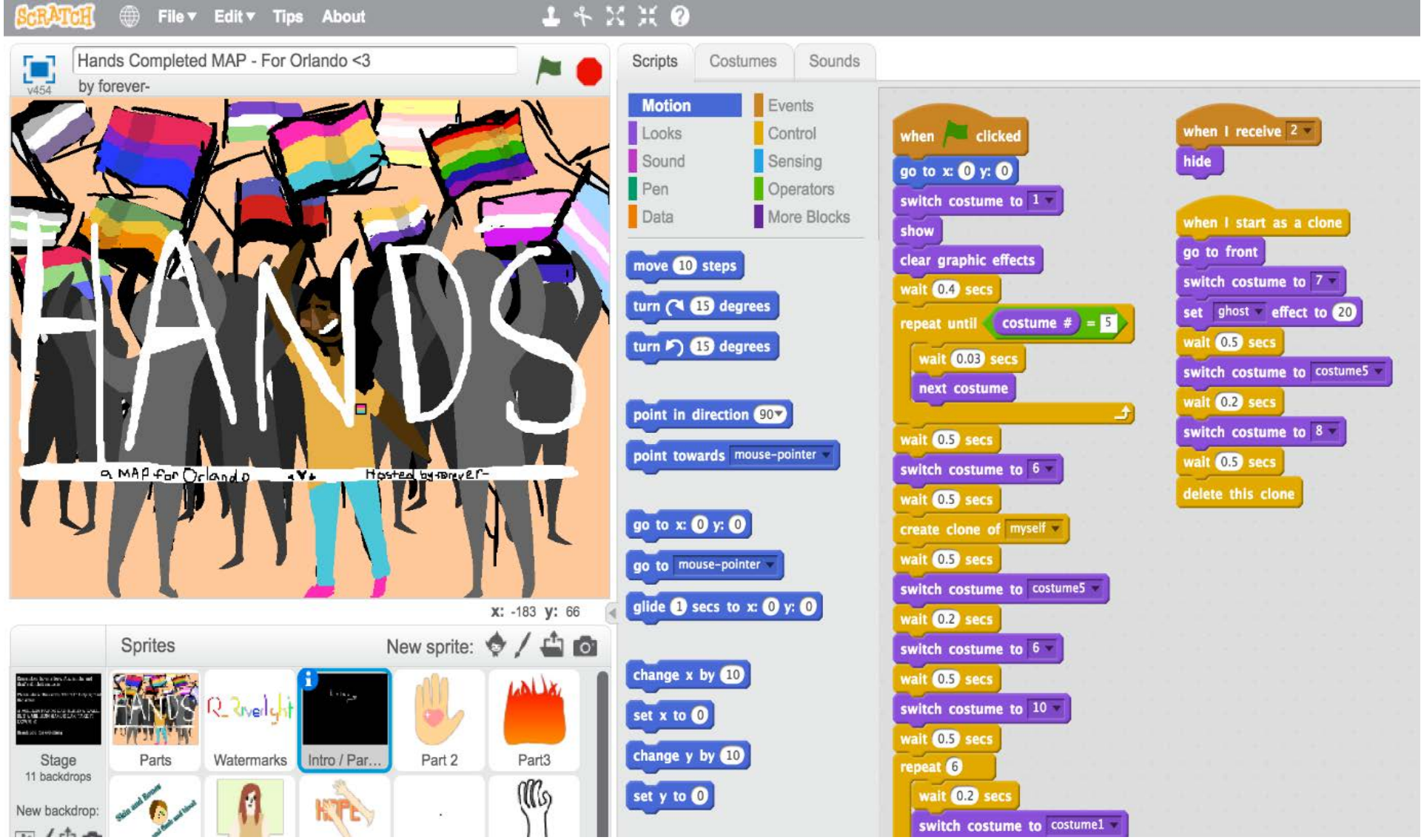
Computational Creators

able to use computing to create things they care about

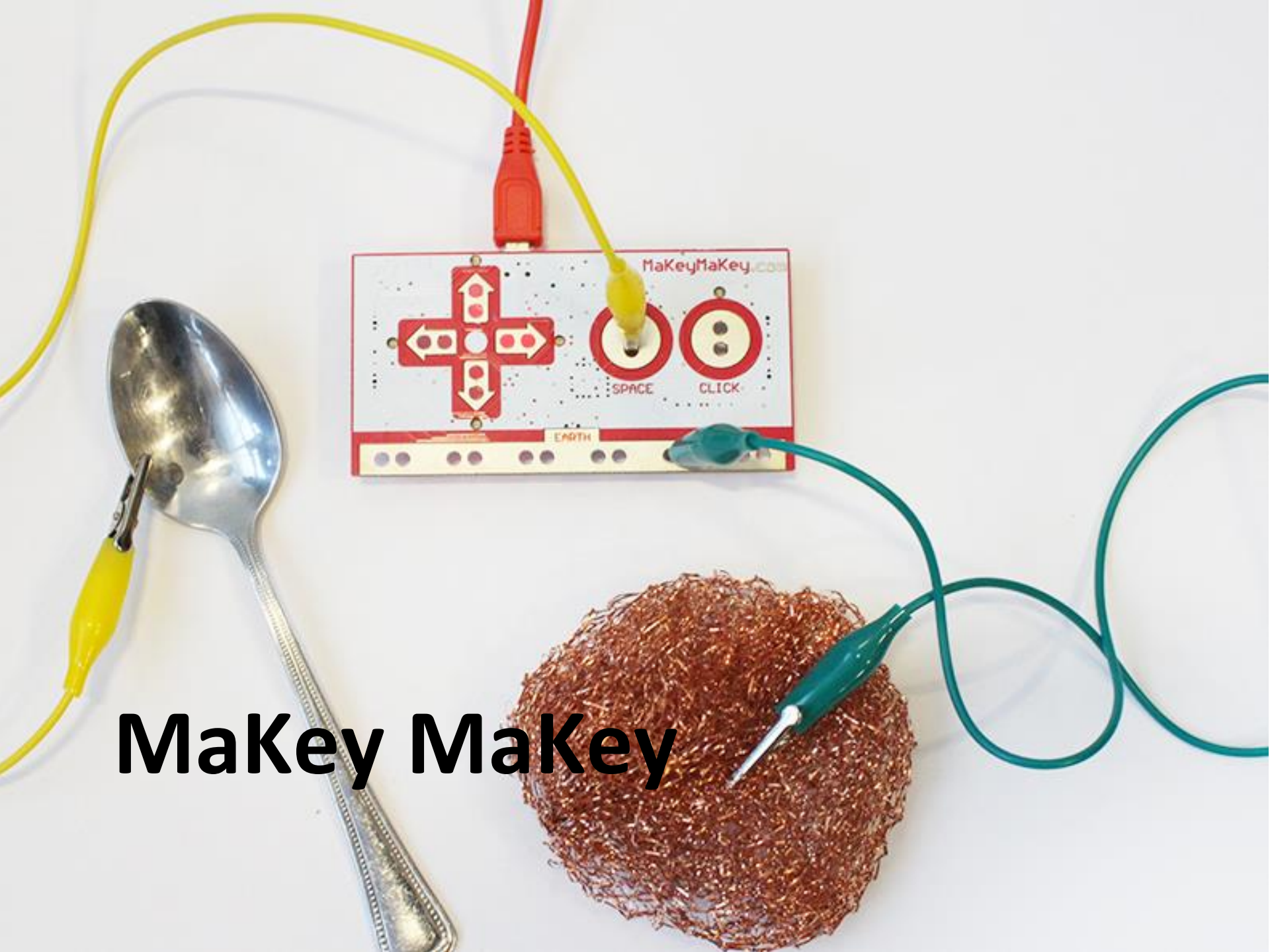
develop identities as creators

see the ways they can shape the world

Family Creative Learning



The Scratch Platform



MaKey MaKey


About us
Play the Drums
Play the Guitar
Raquel


EAT
MEET
MAKE
SHARE

EAT

Start them with something that they're familiar with and know how to do together as a family.

MEET

Allow them to connect and build supportive network among their peers; see their shared experiences in their stories, share strategies, see each other as resources.

MAKE

Focus on what their interests; learn to work together


SHARE
Allow them to get recognition and practice talking about their experience and process.

Families come in all kinds of configurations and work in different ways together.

As much about **building relationships** as it was about building projects

When you make something together with your kids… you become a little bit more close.

- DIANE

Shifting perspectives on themselves, each other, and computing

[My son] was surprised I could do it. He thought I couldn’t do anything on the computer. When he saw that I made something, he was surprised that I made something. He said, “How did you do that? You made that?” He was amazed. He probably thought that he would come over and I would be lost. But I was like, “Oh I got it together.”

- MOTHER OF THREE


NY

It's not about telling parents what to do. It's about just opening up spaces and letting them play and explore with their kids.

- FACILITATOR

Facilitating Fundamentals

Ask questions rather than giving answers

Build trust and relationships

Encourage exploration, experimentation, and risk-taking

Authentic enthusiasm goes a long way

Use technical words cautiously

Be a connector

Connect learners with similar interests to each other and

Surface their interests

Put yourself in their (unique) shoes

Hold the tools as a last resort

Mistakes and failures are welcome!

Our tools: Scratch & MaKey MaKey

Scratch

MaKey MaKey

Why pair them together?

Download the guide:
http://familycreativelearning.org/guide/

Facilitating Learning with English Language Learners[1]

English proficiency is not a requirement for participation in PBS KIDS Family Creative Learning. For some participating families, English may not be the primary language spoken at home. To help support this inevitability, below are some suggestions and practices that can help you as you work to support participating English Language Learners (ELL).

Encourage and support the use of a family's primary language

As families work together, they should feel free to do so in the language that they are most comfortable with. All of the programming blocks and most of the features in the app are icon based, and as such, language should provide few barriers to participants as they explore and create with the app.

To further support ELL families, we would recommend having a facilitator who can communicate in the primary language of participating ELL families. While the app might be language agnostic, FCL itself includes a lot of discussion. Having a facilitator present to help translate the conversation will go a long way in supporting the successful participation of ELL families.

TIP All materials for adults are available in both English and Spanish, and editable versions are available for additional translations. PBS KIDS ScratchJr is also available in Spanish.

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Communicate clearly and allocate wait time

FCL introduces and explores a lot of big ideas. All learners, especially ELLs, will benefit from slow and clear speech. Additionally, allocating wait time after questions and during discussions will allow for the thoughtful formulation of ideas and responses.

Provide multiple means of representation

Check for understanding

...in, pause periodically
...tion with a simple
...eryone feels
...ing simple and
...le, encourage
...they're confused
...s can then personally

Adapted version for younger learners:
https://whut.pbslearningmedia.org/collection/pbs-kids-family-creative-learning/#.WimfN4anGdE

Family Varia...

Beyond the diversity of languages and cultures you are likely to encounter, it is important to acknowledge that families come in all shapes and sizes. As facilitators, it is important to be as prepared and flexible as possible as you work to craft an experience that will successfully support all of your families. Some variables to keep in mind and plan for include:

Families with Multiple Kids

If there are more than three family members present during the sessions, especially if the kids outnumber grown-ups, it will be difficult for the whole family to all work on the same project and even harder for the grown-up to support all of the kids equally as they work together. If you have the resources, consider offering larger families multiple tablets to use and encourage them to work on multiple projects simultaneously. Additionally, make sure facilitators keep an eye on grown-ups trying to support multiple kids at once, as they will most likely benefit from additional support.

Older Siblings

For kids older than eight, the PBS KIDS ScratchJr app and the supporting activities may seem too 'babyish.' If that's the case, there are several fun ways you can engage older siblings by giving them special tasks and challenges throughout the experience:

- **Junior Facilitator** - Many older kids will pick up on how to use ScratchJr very quickly and can assume a junior facilitator role helping to support participating families as they work together on their projects. Providing an older kid with this type of leadership role can be a great way to engage and empower them as learners.
- **Documenter** - Whether just documenting their family experience, or FCL as a whole, older kids can be really helpful documenters. Provide them with a recording device and encourage them to capture pictures, videos, and interviews to help document the creative process of their family and other participants. Additionally, provide them with the opportunity to share their documentation with the group during the Share portion of the sessions.
- **More Advanced Tools** - If you have the resources available and notice older kids quickly mastering the use of ScratchJr, you can point them towards other creative coding apps and websites where they may find more challenging and exciting coding tools:
  - **Scratch** - https://scratch.mit.edu/ a web-based creative coding tool for 8-16 year-olds that works on computers (and requires web access).
  - **Hopscotch** - https://www.gethopscotch.com/ an app-based creative coding tool for 8-14 year-olds that works on iPads and iPhones.

Photo courtesy of Ideastream

Some parting strategies…

1. Focus on building relationships as much as building projects
2. Allow parents to have first-hand experience
3. Address the different needs of families
4. Choose creative technologies that allow them to express their ideas and interests
5. Shift from being instructors to being facilitators

Sarah Carter
SciGirls

Ricarose Roque
Family Creative Learning

Audience Q&A

Thank you!

Questions: Email mjballard@afterschoolalliance.org