Equity in Tinkering & Making

May 27, 2015

Afterschool Alliance

Today's Speakers

Melissa Ballard

STEM Manager

Afterschool Alliance

Meg Escudé

Director of Community Youth Programs

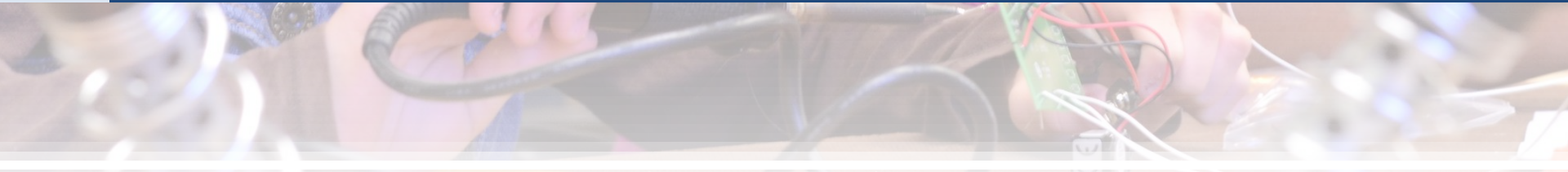California Tinkering Network

Exploratorium

Emilyn Green

Executive Director

Community Science Workshop Network

Afterschool Alliance

Webinar Overview

1. Snapshot of Programs (20 min)

   - California Tinkering Network

     o   With the Boys & Girls Clubs

     o   Community Science Workshops

2. Digging into Equity (20 min)

3. Audience Q&A (10 min)

4. Resources & Upcoming Opportunities (5 min)

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Defining Equity

Equity as Access

1,395 HRS + 220 HRS + 245 HRS + 1,080 HRS + 3,060 HRS =

PRE-SCHOOL

FAMILY READING TIME

WEEKEND DAY TRIPS

SUMMER CAMP

AFTER-SCHOOL ACTIVITIES

6,000-HOUR LEARNING GAP

Source: The After School Corporation (TASC)

Afterschool Alliance

Equity: Going Beyond Access

Non-dominant populations:
Race/ethnicity, class, gender identity, language, disability

1. Not about "sameness."

2. Avoiding reproducing or perpetuating inequities.

3. Being mindful of the types of experiences kids might have in other learning environments—make STEM meaningful, relevant, & empowering.

4. Envisioning a new model for STEM learning.

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The After-School Tinkering Program
Part of the California Tinkering Network
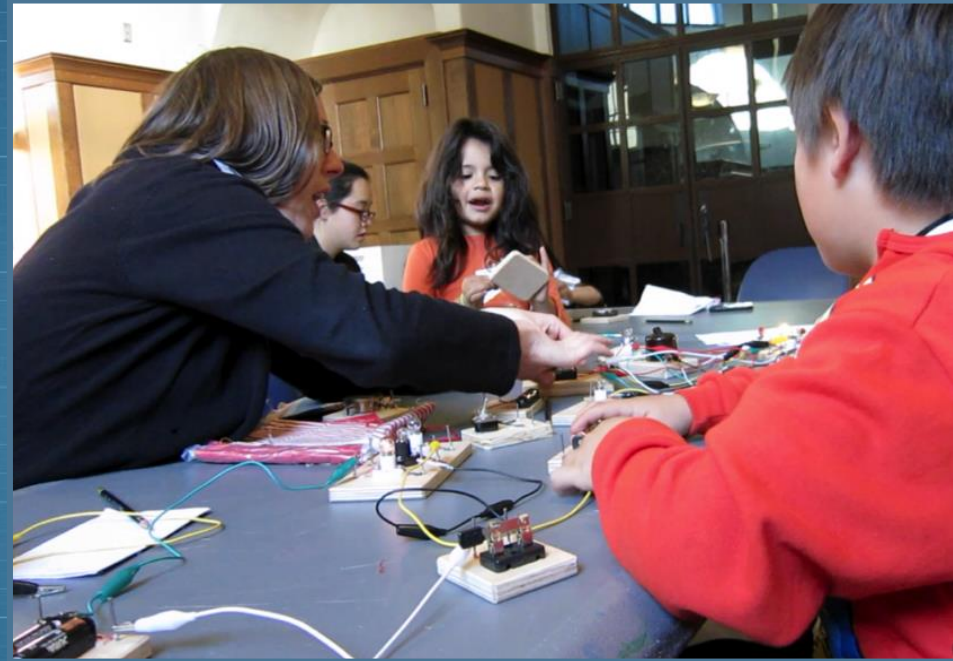
- **Partnership between the Exploratorium & SF Boys & Girls Clubs**

- **Weekly workshop focused on STEM learning & the arts**

- **Collaboration between researchers & teachers (adult & young adults)**

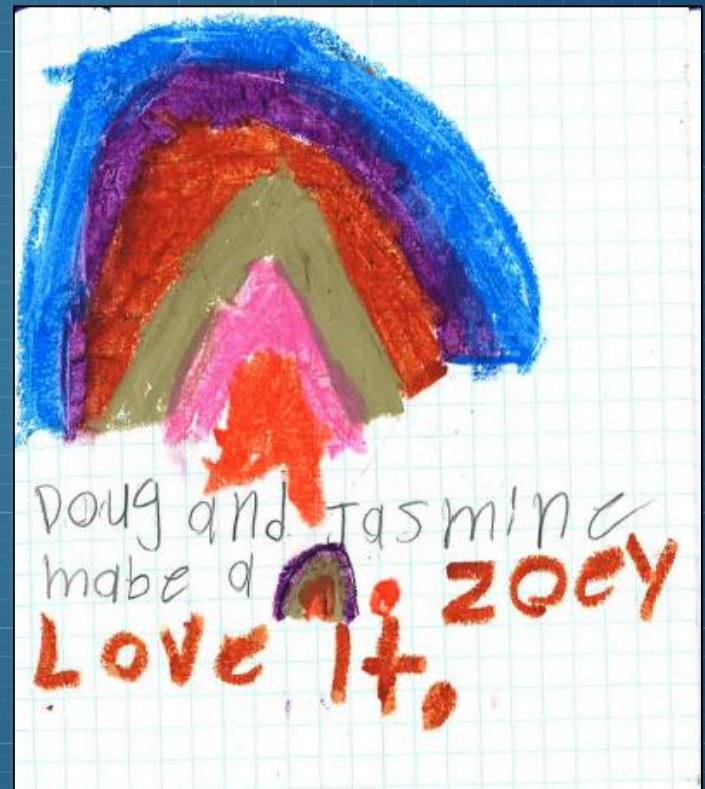- **Research focus: teaching, learning & equity**

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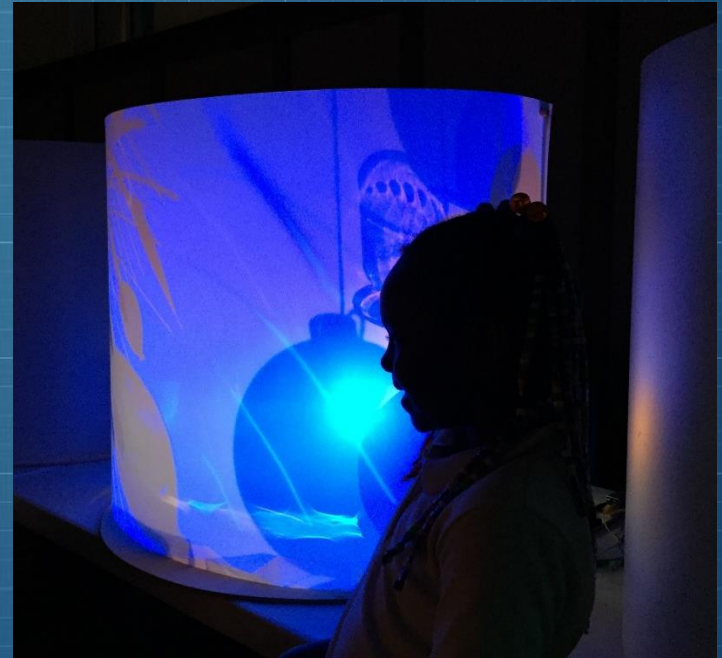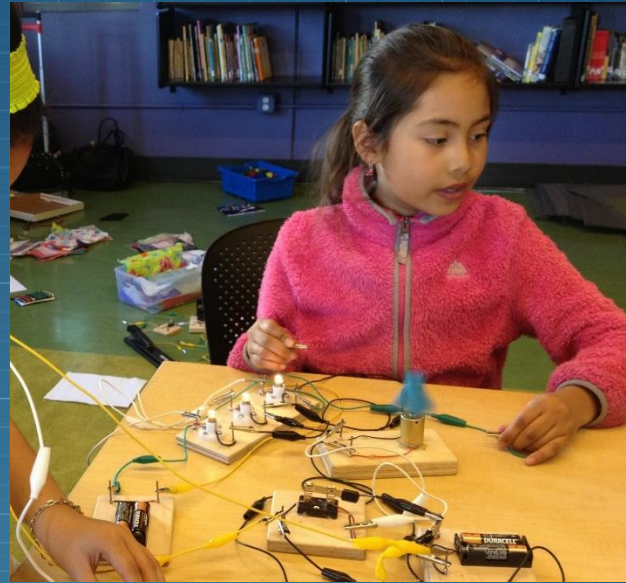
Activity Guides: http://tinkering.exploratorium.edu/projects

Explicit focus on Process & Shared Activity

Facilitators using Research Practices

Website: California Tinkering Afterschool Network

Paper:

Tinkering, Learning and Equity in the Afterschool Setting

Shirin Vossoughi, Meg Escudé, Fan Kong & Paula Hooper

Part of the 2013 FabLearn Conference

Blog Interview:

Grappling with Equity & Gaze: A conversation with Shirin Vossoughi & Meg Escudé

Read on DML Central
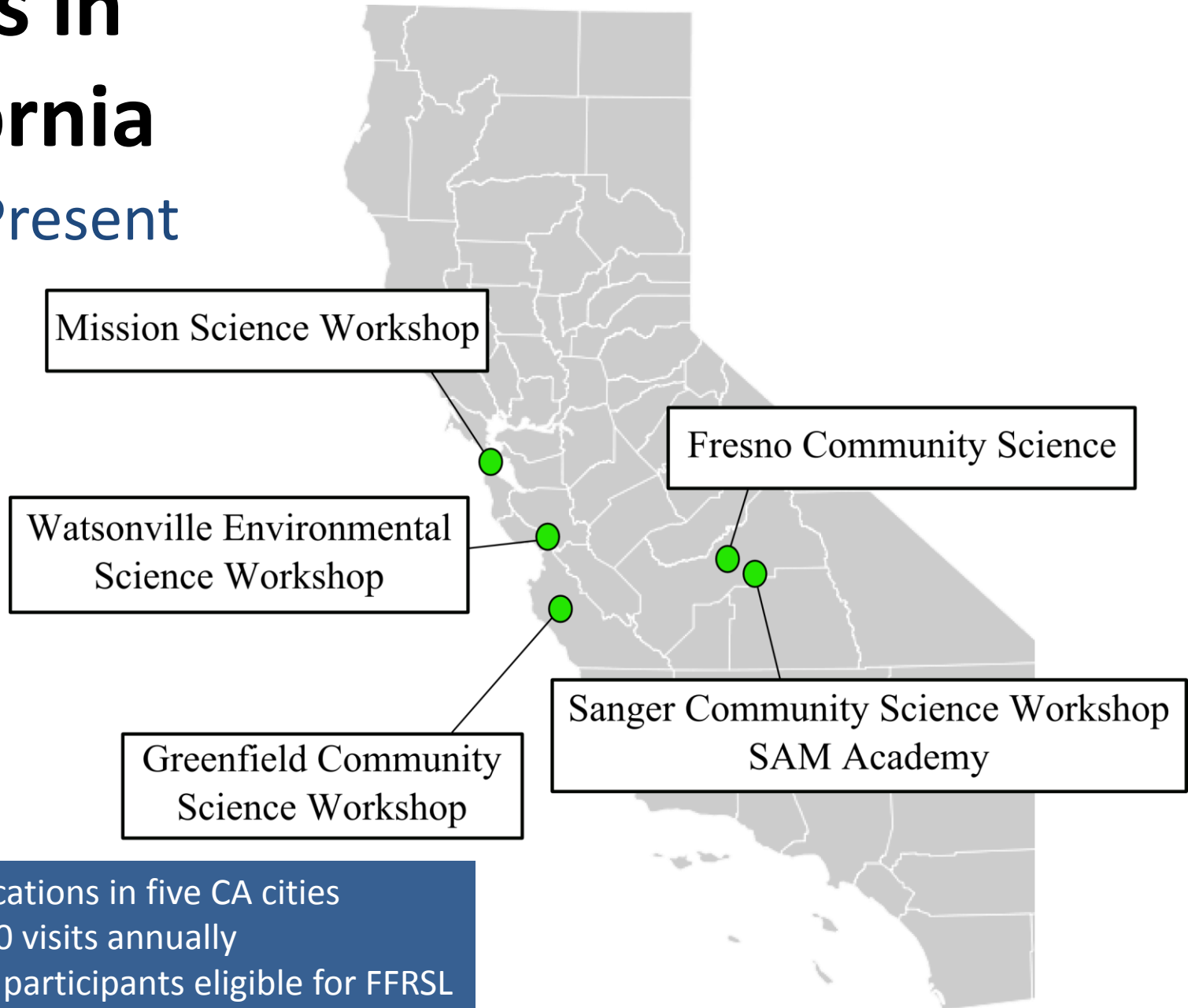
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Community Science Workshop Network

Photo courtesy of Watsonville Register-Pajaronian

Community-based nonprofit programs providing opportunities for underserved youth to tinker, make, and explore their world through science.

CSWs in California

1991 - Present

Mission Science Workshop

Fresno Community Science

Watsonville Environmental Science Workshop

Greenfield Community Science Workshop

Sanger Community Science Workshop
SAM Academy

- Over 150 Locations in five CA cities
- Over 120,000 visits annually
- Over 70% of participants eligible for FFRSL

Photo courtesy of Santa Cruz Sentinel

Interactive Science Exhibits + Making and Tinkering

Community Access

- **Permanent, dedicated spaces** located on existing walking routes to low-income homes and schools
- **Free** to individual participants and affordable for schools
- **Drop-in hours** let kids participate without enrollment forms and permission slips
- **Partnering** with **existing enrollment-based programs** to reach broad sectors of the community
- **Multiple entry points** in time and space

Role Models and Relevancy

- Recognizing the value of the **community's** existing **knowledge base**

- **1/3 of educators** statewide are **former students** or parent volunteers

- **Majority female** staff members

- **Bilingual** facilitators & labels

- Students are encouraged to express their expertise through **mentoring** & **peer-to-peer** learning

This is Your Science Workshop
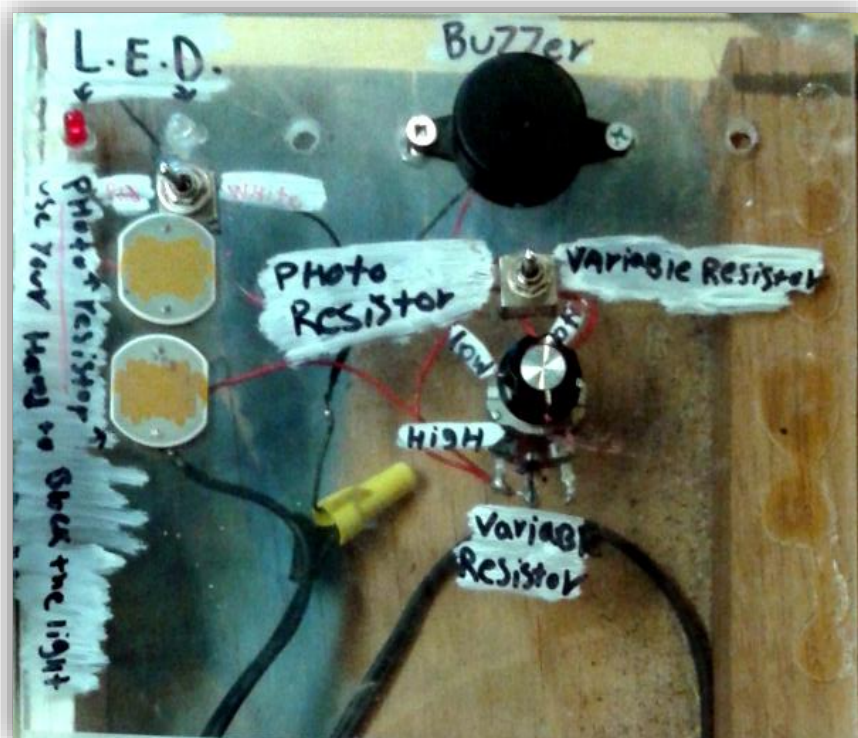
- **Everyday materials** and hand-made exhibits

- Tools stored at **kid-height**

- **Purposefully messy** environment shows kids that **nothing is off-limits**

- **User-generated content**

Open-Ended and Student-Driven

- **Frustration** is part of a positive process of learning

- **Students choose** what they want to do, how they want to do it, **what** questions to ask & **how** they want to answer them

- Emphasis on the **Science & Engineering Practices** vs. a particular content area or material

- Adults **facilitate**

- **Infinite combinatorial capacity** in activities, tools & materials as presented in the space

California Tinkering Afterschool Network Collaboration – New PD

- New PD tools to help **staff** identify the **values** driving their work

- "Welcoming everyone to the same opportunities"

- "Students are in charge, not us, we just make it possible for them to succeed"

- "All kids are smart no matter what!"

Inequities Exist!
(and how they show up in the program)

- Patient girls, guys with ideas

- "Anyone here done robotics before?"

- Impatient to finish the project

Check out our website at:

www.cswnetwork.org

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Digging into Equity
Facilitated Questions

Tips you can use (tomorrow!)

Questions that encourage meaning-making vs. the 'right' answer

- Can you imagine how this was made?

- What did you discover while working on/playing with circuits?

- What are some of the things you investigated?

- What surprised you while you were investigating or building?

- What tips would offer someone doing this for the first time?

- What new questions do you have now?

Questions that value process & iteration

- What was the part that made you think the hardest or work the longest on?

- What part of your plans changed while you were building?

- Tell us the story of your project? How did it come to be?

- What's the trickiest part about working with (motors, circuits, etc.)?

- What tips would you offer someone doing this for the first time?

- What would work on if you had more time?

Audience Q&A

New Resources

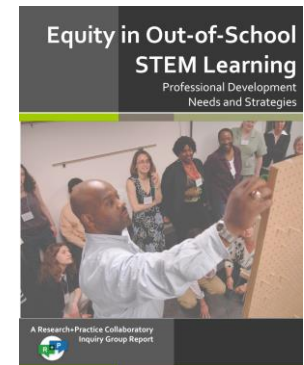## 1| Connected Collections:

A set of research briefs on a hot topic in science education, along with a synthesis.

- [Equity in Science Education](#)

- [Tinkering & Making in STEM Education](#)

2| Equity in Out-of-School STEM Learning:
Professional Development Needs & Strategies

Afterschool Alliance

Thank you for attending!

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