



The Role of Major and Mid-scale Research Infrastructure in Fueling the US STEM Workforce Pipeline – PreK-12

2022 Research Infrastructure Workshop

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September 15, 2022



Project Collaborators:



This material is based on the work supported by the National Science Foundation (NSF) under [Grant # 2011518](#). Any opinions, findings, or conclusions expressed in this material are those of the authors and do not necessarily reflect the views of the National Science Foundation.

Goals of the STEM Career Connections project:

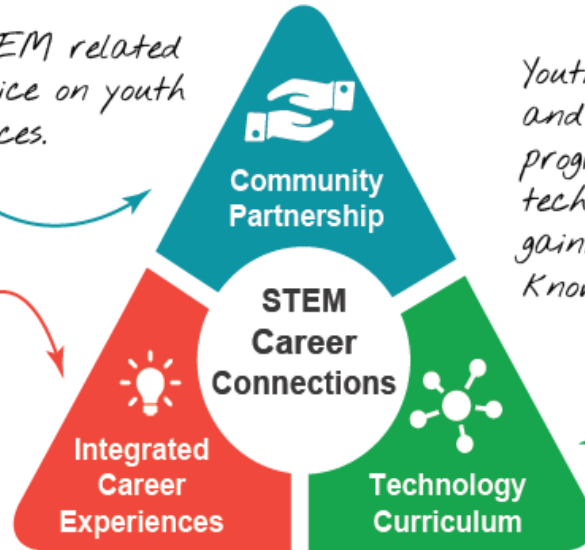
- To connect the classroom with real-world examples of STEM careers: to make the curriculum come alive!
- To help build partnerships that support students and teachers
- To stimulate youth interest in STEM career opportunities



STEM Career Connections Project Overview

Local community members with STEM related careers meet with youth, offer advice on youth projects, and share career experiences.

Youth explore career pathways and opportunities that are integrated into the curriculum using existing career readiness materials (such as Naviance) in collaboration with Eagle Valley school counselors.



Youth in afterschool clubs and summer camps investigate programmable sensor technologies and 3D printers, gaining STEM skills and Knowledge throughout the unit.



2021-2022 STEM Career Connections Program

Worked with the Eagle County (Colorado) Career Counselor, STEM teachers and local afterschool providers:

Quarter 1:

Worked with the district career counselor to choose “global ready skills” to focus on

Quarter 2:

Developed/ adapted career-based lessons that built upon district career readiness goals, using Naviance resources

Quarter 3:

Sensor Immersion Curriculum with Career Connection Lessons

Quarter 4:

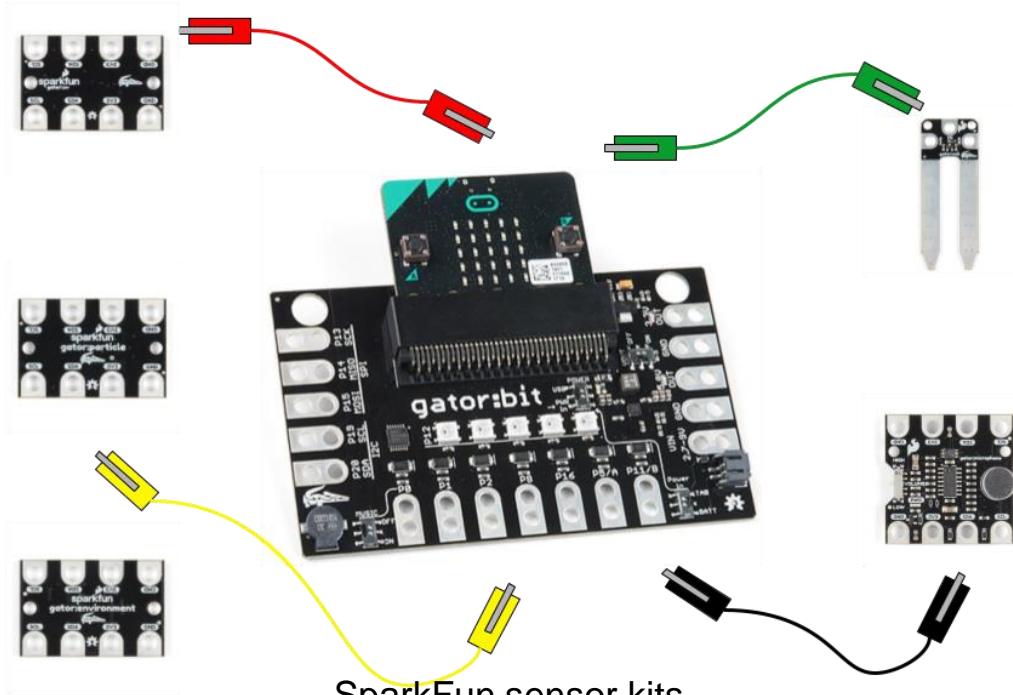
Sensor Immersion Curriculum with Career Connections Lessons and mentors/guest speakers

Summer Camp:

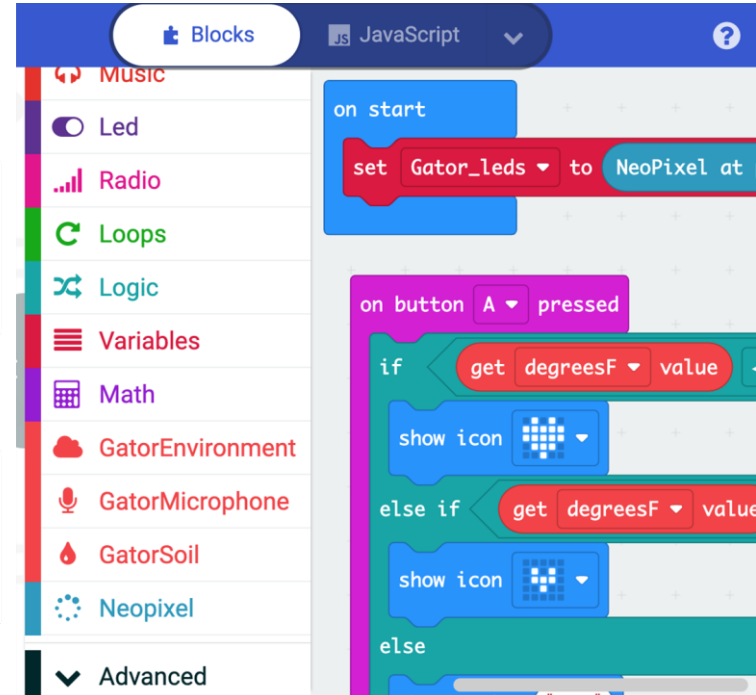
Two-four week summer camps that included youth working with programmable sensors along with integrated Career Connections and Mentor experiences



STEM Curriculum: Sensor Immersion



SparkFun sensor kits



MakeCode programming



STEM Careers Card Sort and Career Wall

Set #1

What is a STEM Career?

Decide where to place each career along the line based on whether you think it is more or less like a STEM career.



Aerospace Engineer

Perform engineering duties in designing, constructing, and testing aircraft, missiles, and spacecraft.

Healthcare Social Worker

Provide individuals, families, and groups with the psychosocial support needed to cope with chronic, acute, or terminal illnesses.

Surveyor

Make exact measurements and determine property boundaries. Provide data relevant to the shape, contour, gravitation, location, elevation, or dimension of land or land features.

Computer Programmer

Create, modify, and test the code, forms, and script that allow computer applications to run.

Astronomer

Observe, research, and interpret astronomical phenomena to increase basic knowledge or apply such information to practical problems.

Nuclear Engineer

Conduct research on nuclear engineering projects or apply principles and theory of nuclear science to problems concerned with release, control, and use of nuclear energy and nuclear waste disposal.

Statistician

Develop or apply mathematical or statistical theory and methods to collect, organize, interpret, and summarize numerical data to provide usable information.

Biomedical Engineer

Apply knowledge of engineering, biology, and biomechanical principles to the design, development, and evaluation of biological and health systems and products

General & Operations Manager

Plan, direct, or coordinate the operations of public or private sector organizations.

Political Scientist

Study the origin, development, and operation of political systems. May study topics, such as public opinion, political decision-making, and ideology.

Physician Assistant

Provide healthcare services typically performed by a physician, under the supervision of a physician.

Accountant & Auditor

Examine, analyze, and interpret accounting records to prepare financial statements, give advice, or audit and evaluate statements prepared by others

Fundraiser

Organize activities to raise funds or otherwise solicit and gather monetary donations or other gifts for an organization.

Construction Manager

Plan, direct, or coordinate, usually through subordinate supervisory personnel, activities concerned with the construction and maintenance of structures, facilities, and systems.

Community Hero Interviews

- **What STEM jobs are in your community?**

Career title here

INSERT PICTURE HERE

1. Describe the job. *What does a person in this career do?*
2. Explain whether this is a STEM career or not. *How do they use Science, Technology, Engineering, or Math?*
3. Why is this career needed? *How does their work help your community?*
4. How can you get a job like this? *What types of training or education would you need to have this career?*



Connecting to STEM careers in your community

- **STEM professionals were invited to be mentors**
 - We targeted mentors with skills that related to the curriculum
 - Mentors share about their work and career path
 - Students ask questions relating to interests, training/skills, job tasks, etc
 - Mentors & students brainstorm real-world applications of the work they are doing in class
 - Students practice explaining their ideas and receiving feedback



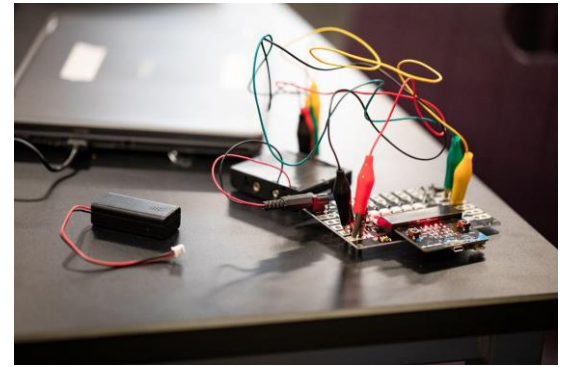
Recruiting Mentors from NCAR

Name/Lab	Year	Description
Frank Flocke ACOM	Summer 2021	Virtual mentor; spoke with students 3 times about his work in air quality & wildfire science and mentored students about their sensor project ideas
Julie Haggerty EOL/RAF	Spring 2021	Virtual mentor; spoke with students 3 times about her work using instruments to measure the atmosphere from the NCAR aircraft (NCAR Research Aviation Facility) and mentored students about their sensor project ideas
Alice Lecinski ACOM	Spring 2021	Virtual mentor; spoke with students 3 times about her work in ACOM programming the hardware used in scientific instruments and mentored students about their sensor project ideas
Christina McCluskey CGD	Spring 2021	Virtual mentor; spoke with students 2 times about her work in CGD doing CESM modeling and mentored students about their sensor project ideas
Ivan Ortega	Spring 2022	Virtual mentor; spoke with students 3 times about his work in ACOM with remote ground based sensing (coding and building instruments that measure atm composition) and mentored students about their sensor project ideas. Ivan also gave the students a virtual tour of his lab, explaining the equipment that he works with, and showed samples of the coding that he works on

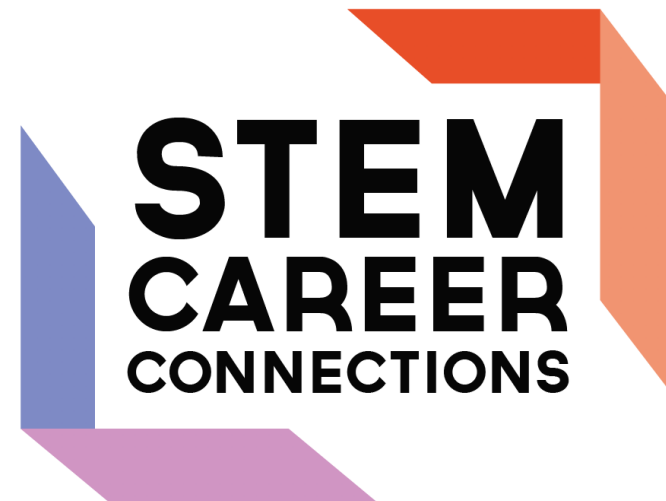


Promising Practices

- Learn about the local STEM ecosystem
- Align with community partners who share similar goals
- Have a meet and greet with teachers, mentors, and researchers
- Provide support to instructors for logistics and to mentors around youth engagement
- Ask students to develop questions for mentors ahead of time
- See Mentor Tips Handout for more ideas



Thank You!



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STEM For All Video:

<https://multiplex.videohall.com/presentations/2304>

CU Boulder SchoolWide Labs [Sensor Immersion Curriculum](#)

