Building Quantitative Literacy Through Science, Education, and Art

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ART AS EXCHANGE + ENGAGEMENT

Interdisciplinary methodology promotes more inclusive approaches to Earth Science learning

Valuing different kinds of knowledge production deepens connections to climate science for students, educators, and public

Platforms for qualitative learning create increased access to, and engagement with, quantitative information in fieldwork and outreach
ART AS DOCUMENTATION

Geologic forces and the passage of time

Tool for recording, processing, and sharing complex information
HANNAH’S WORK: cyanotype photography
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BLIND CONTOUR DRAWING

Deep observation and close looking

Easy intro to field sketching for “non-artists”

Helps cement features to memory + more fully understand complex visual information
STUDENT WORK: blind contour drawings
ART AS PROXY

Objects and installations using geologic material, data, and ideas

Diverse pathways to connect with scientific data and abstract concepts
HANNAH’S WORK: ice core installations
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HANNAH’S WORK: glacier cyanotypes
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CYANOTYPE PRINTMAKING

Recording material + specimen in the field

Specific to place, time, and human interaction

Photographic process of objects and information
STUDENT WORK: cyanotype prints, geology + ecology samples
COLLABORATIVE HYDROLOGY FIELDWORK: cyanotype prints of firn samples at depth
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ART AS STORYTELLING:

Collaborative research opportunities

Participatory experiences for engagement, deepening connection to fieldwork and data

Diverse forms of sci comm + outreach
HANNAH’S WORK: women in STEM mural
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MARYAM MIRZAKHANI  
Mathematician  
1977 - 2017  
Maryam Mirzakhani was an Iranian mathematician and professor at Stanford, and the first (and only) woman to win the Fields Medal. Her work in theoretical mathematics, specifically concerning the geometry of curved surfaces, could impact the theoretical physics of how the universe came to exist.

ANNE EASLEY  
Mathematician  
1935 - 2011  
Ann Easley was a computer programmer, mathematician at NASA, and one of the first African-American women rocket scientists in the field. During her 34-year career, she worked on technologies that led to hybrid vehicles, and developed software for the Centaur rocket — critical to making modern spaceflight possible.

ALICE BALL  
Chemist  
1892 - 1916  
Alice Ball was an African-American scientist who developed the first successful treatment for Hansen’s disease (leprosy). The “Ball Method,” an injectable treatment using oil from the chaulmoogra tree, was used on thousands of infected individuals for over thirty years, until modern drugs were introduced.

KATHERINE JOHNSON  
Mathematician + Engineer  
1918 -  
Katherine Johnson is an African-American mathematician whose calculations of orbital mechanics were critical to the success of the first and subsequent US-manned space flights. Throughout her career at NASA, she mastered complex calculations and helped pioneer the use of computers.

CAROLINE HERSCHEL  
Astronomer  
1750 - 1848  
Caroline Herschel was a pioneering German astronomer. The first woman to discover a comet, she discovered 8 over the course of her career, including 35P/Herschel–Rigollet, which bears her name. She worked closely with her brother, astronomer William Herschel, who is credited to discovering the planet Uranus.

EUNICE NEWTON FOOTE  
Climate Scientist  
1819 - 1888  
Eunice Newton Foote was an American scientist, inventor, and women’s rights campaigner. She was the first person to identify the greenhouse gas effect, critical in modern studies of climate change. Although physicist John Tyndall is often credited with this discovery, he actually expanded on Foote’s research.
SCIENCE ILLUSTRATION + VISUALS

Help reach a wider audience with diagrams + figures

Clearly communicate findings and complex concepts
Maddie Hall

Blob North Nunatak

Yueyi Che. University of California, Berkeley

Blob North Nunatak

About 10,000 years ago

Yueyi Che

Alexia Fabiani

STUDENT WORK: science illustration
PARTICIPATORY PROJECTS

Collective creative engagement deepens connections to each other, to field science, and to quantitative info

Amplifies diverse forms of knowledge production and ways of relating to place
STUDENT WORK: collaborative cyanotype prints + memory exchange
THANK YOU! FEEL FREE TO REACH OUT:

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MORE ABOUT ME:

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