

Doing Community Science: An Egalitarian Community Action Partnership Model

URBAN STEM STEWARDS

Place-based Citizen Science
with Community Partners



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Today we will focus on...



- introduce project- Urban STEM Stewards
- highlight theoretical framework- environmental commons in the urban ecology
- overview of pedagogical practices that work
- share examples of youth activism in Urban STEM Stewards
- share study results



In order to pique
the interest of
students
underrepresented
in STEM

Connect the
utility of STEM
learning to
community
contribution

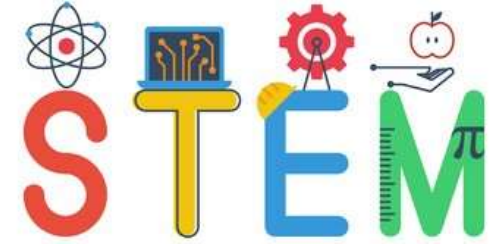


Goals:

Increase students' beliefs about what they can do with science to contribute to their community

Help students see how they can apply STEM in a variety of future careers to affect their communities for the better

Develop students commitments to the environmental commons

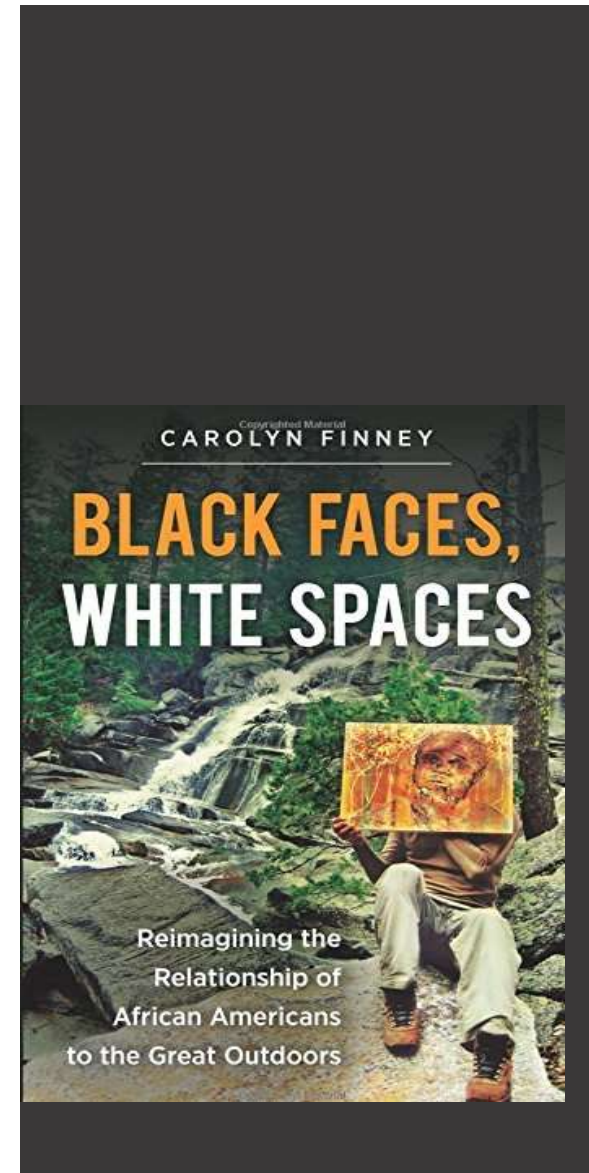


Increasing Awareness: Natural Environment in Urban Ecology

POPULAR IMAGES HUMANS IN NATURE



HUMANS AND NATURE IN THE URBAN ECOLOGY



A collage of black and white photographs depicting various urban scenes, including people, buildings, streets, and vehicles, overlaid with the text "MY NEIGHBORHOOD IS KILLING ME". The text is arranged in four lines: "MY" (top left), "NEIGHBORHOOD" (top right), "IS" (middle left), and "KILLING ME" (bottom right). The word "KILLING" is in red, while the others are in black. The photographs show a mix of everyday life and potentially hazardous or gritty urban environments, such as a playground, a street with a stop sign, a large truck, and people in various settings.

For Urban Youth

- Build Awareness:
 - Nature is part of urban ecology
 - Quality of life in urban community depends on health of natural environment
 - Human impact can have negative and positive impacts
 - Current environmental conditions are not static
 - Learning can be applied to solve public problems
- Build Community Identification
- COLLECTIVE Action – boosts confidence and efficacy

ENVIRONMENTAL COMMONS

NATURAL RESOURCES
on which life depends



&

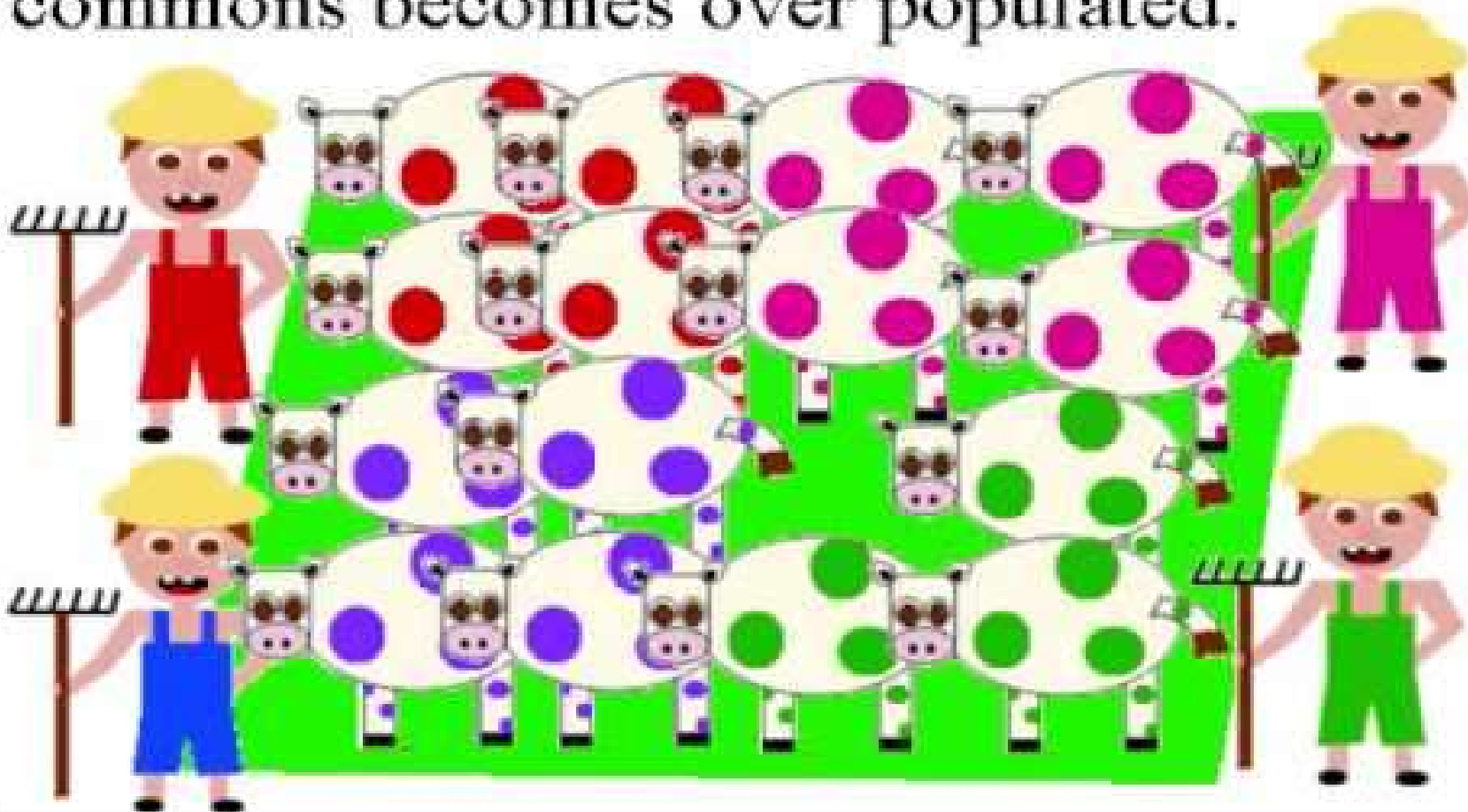
PUBLIC SPACES

where we gather to
negotiate how we care for
those resources, each other
and our communities



Tragedy of the Commons

They continue to add cows until the commons becomes over populated.

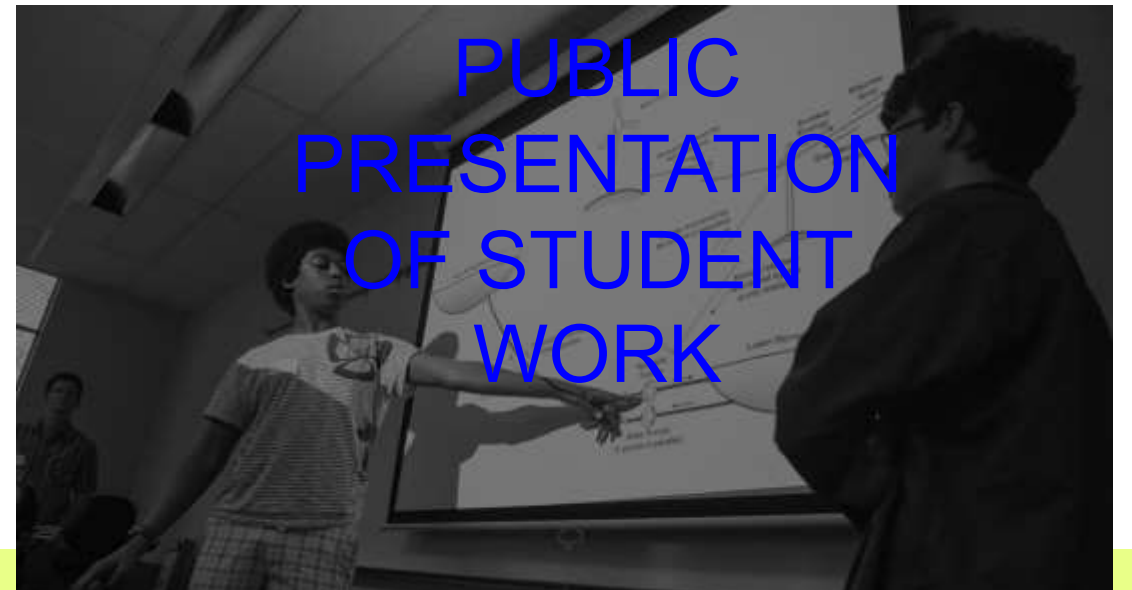


CHALLENGING THE TRAGEDY

“There is no reason to believe that bureaucrats and politicians, no matter how well meaning, are better at solving problems than the people on the spot, who have the strongest incentive to get the solution right.”
— Elinor Ostrom



The Learning Model



Partnerships with STEM Professionals

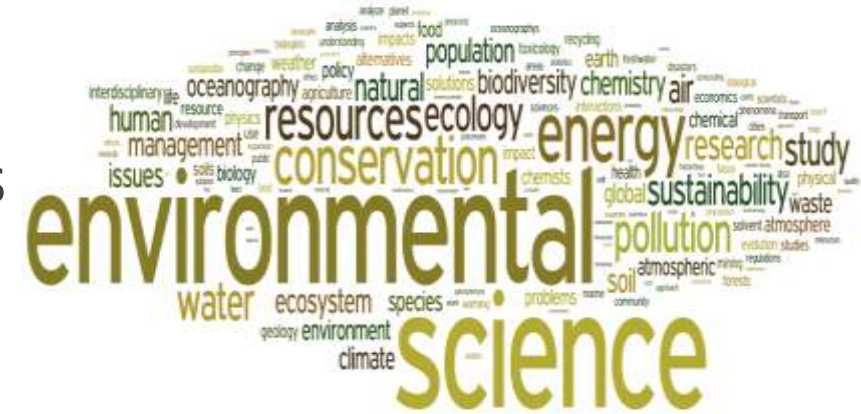
STEM Knowledge and Skills

- Identify local environmental problem
- Observe, collect/analyze data
- Propose/enact solution
- Teamwork
- Stakeholders
- Communicate results in public venue



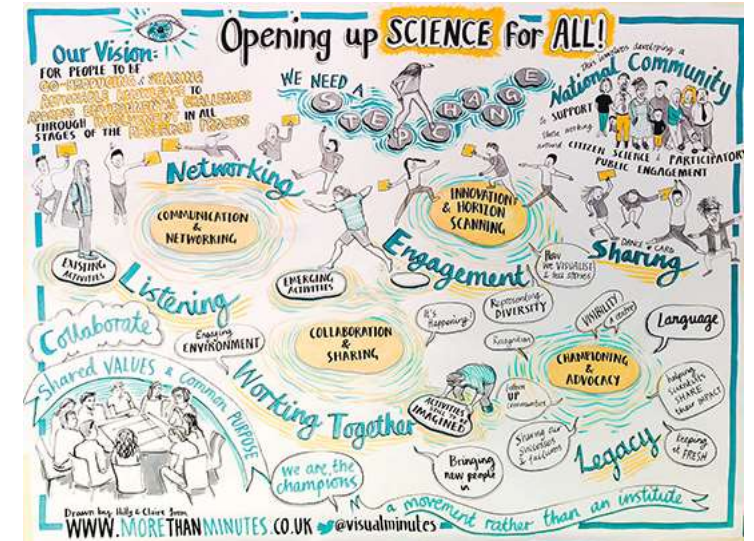
Want students to know they are:

- applying STEM learning to address a local environmental issue, just like community partners
- engaging in community environmental science



Want students to understand:

- STEM professionals are people *like you* who work in careers where they use *STEM content and process like you are using* to improve conditions in communities *like yours*



How we think this will happen

- Students working WITH community partners/community scientists to DO science
- DOING community science themselves
- Contributing to their community through science - making a positive contribution to their community



Ecosystem Services & Green Infrastructure: Mitigating Flooding on School Grounds Rain Gardens





Ecosystem Services & Green Infrastructure: Mitigating Flooding on School Grounds by Installing Porous Pavement

Ecosystem Services & Green Infrastructure: Mitigating Flooding on School Grounds

Porous Pavement



Making STEM Explicit

- Journal reflections
- Short videos



Student Reflection Activity

Students were asked

Do you consider (the community partner) a scientist?

Circle one Yes No Somewhat

How can you know for certain? Cite at least three pieces (or more) of evidence to explain why you gave that answer.

What do you notice in students' answers?

Reflection pair share

Short reflection with a partner

- What are two ways YOU use science in your work to help the community
- Explain how using science in this way helps the community

What students learn from their stewardship projects

ENVIRONMENTAL COMMONS: NATURAL RESOURCES ON WHICH LIFE DEPENDS

- Awareness of Nature in Urban Space
- Diversity and Ecological Balance in Nature
- Interdependence

Healthy natural systems and species' well being

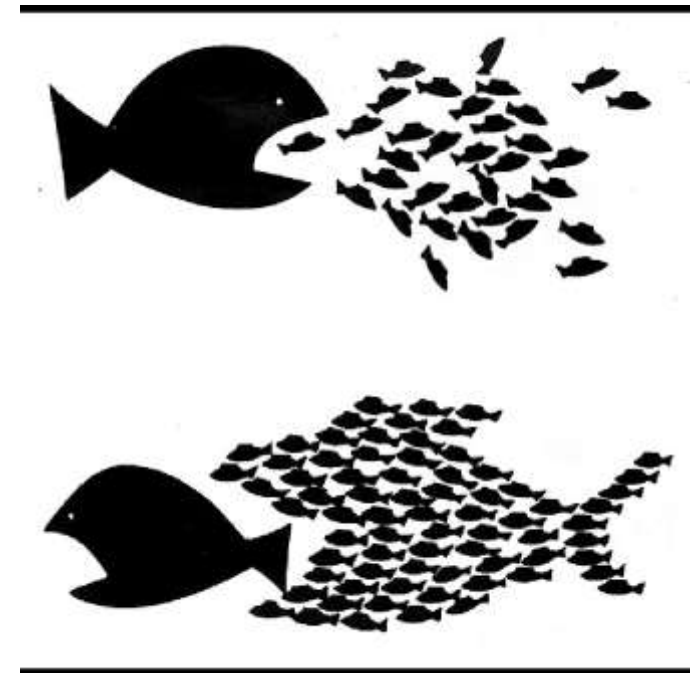
Between health of humans and other living things

- Environmental Identity
- Human Impact and Agency



ENVIRONMENTAL COMMONS: COLLECTIVE DELIBERATION AND ACTION IN PUBLIC SPACES

- Benefits and Need for Team Work
- Dynamics within the group - Interdependence
- Civic competencies gained in group work
- Collective Efficacy
- Generativity
- Identifying with the broader community

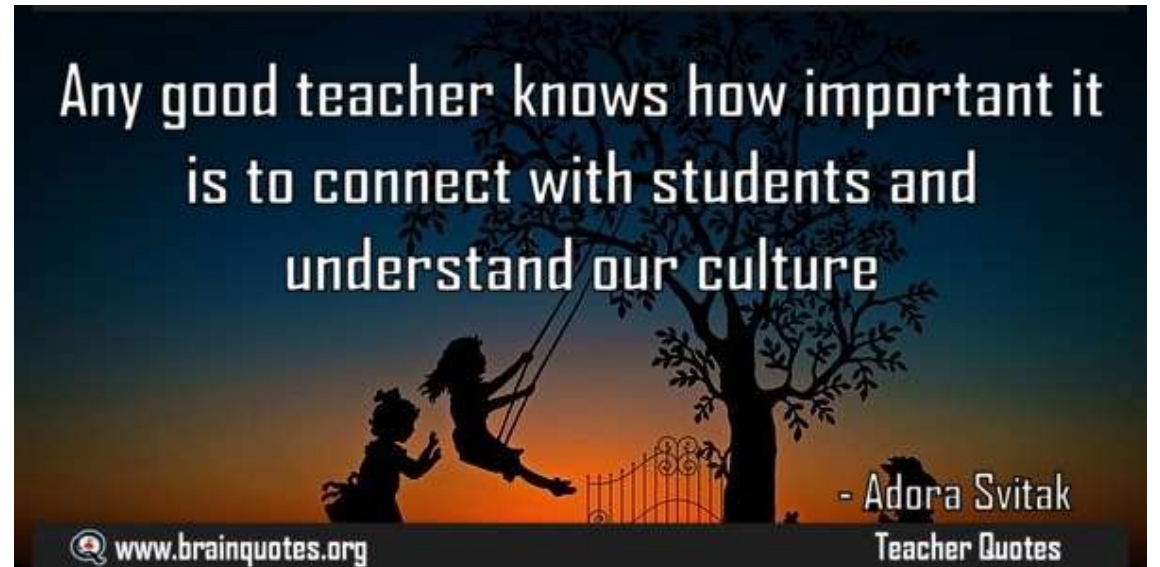


Increases

- Community relevance of class

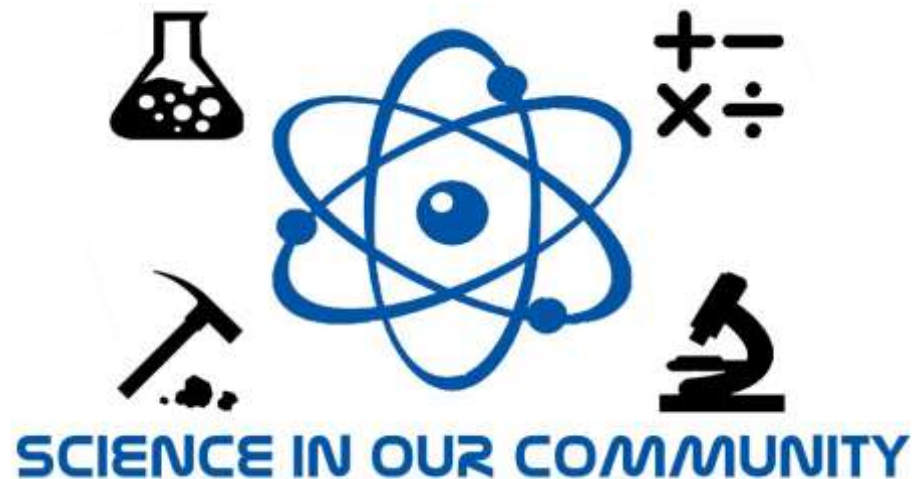


- Cultural connection of class



Increases

- Science job affordances-community contribution
- Community contribution of scientists

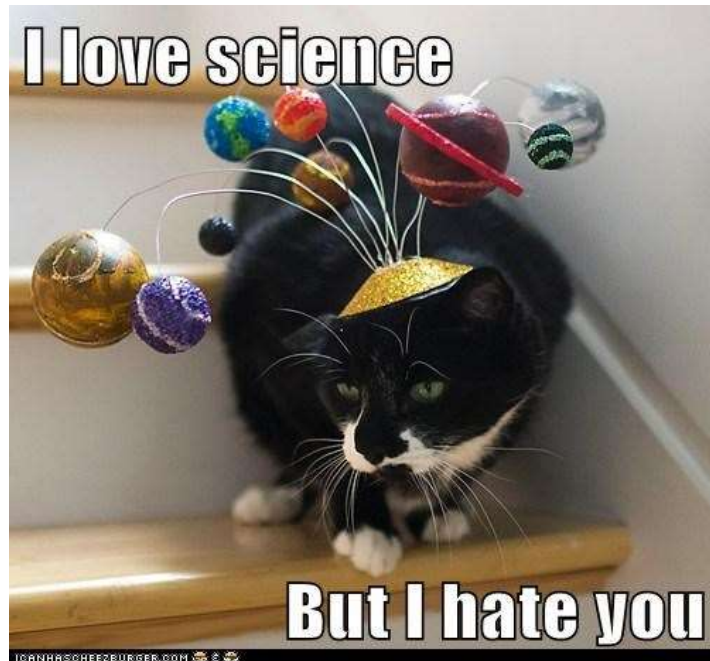


In my community, I
help out by



Increases

- like/enjoy a job using science
- confidence in getting/succeeding in a job using science



Increases

- interest in environmental science/action



- sense of civic efficacy



Increases

- beliefs about the utility of science/their class for their lives and for solving community problems
- beliefs that most people can understand science and that caring about people is integral to doing science



Main story

Students showed gains in their beliefs about the USEFULNESS of *doing* science in this way (applying science to local environmental issues) for enabling them to ADDRESS COMMUNITY NEEDS.



What role can your children play in protecting our earth?



Take aways



What ideas do you want to take away, implement, or modify for your own practice?

Jot down ahas and things to remember

- Reflecting is on applying science to contribute to community is important
- Doing/using science is more relevant than being scientists
- Sharing in public forums is important
- Exposing students to careers/connections can make a difference

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