

# Moving From Awareness to Action: A Co-produced Creative Climate Change Curriculum

CSTPR Seminar Series

9/24/19

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# Overview:

- Why integrate science and art- a journey of necessity
- Art/Science integration for awareness
- Art/Science integration for action













“The ocean is downhill from everywhere”

-Captain Charles Moore









# **Plastics have entered the base of the ocean food chain.**

**“We examined plastic ingestion by two foundation species near the base of North Pacific marine food webs, the calanoid copepod *Neocalanus cristatus* and the euphausiid *Euphausia pacifica*... and detected microplastics in both species.”**

Jean-Pierre W. Desforbes, Moira Galbraith, Peter S. Ross. (2015) Ingestion of Microplastics by Zooplankton in the Northeast Pacific Ocean. Archives of Environmental Contamination and Toxicology, 2015, Page 1







# Microplastics and the chemicals they are made with have been found in:

- Tap water
- Bottled water
- Ground water
- Soil
- The air we breath
- The food we eat
- ... Us

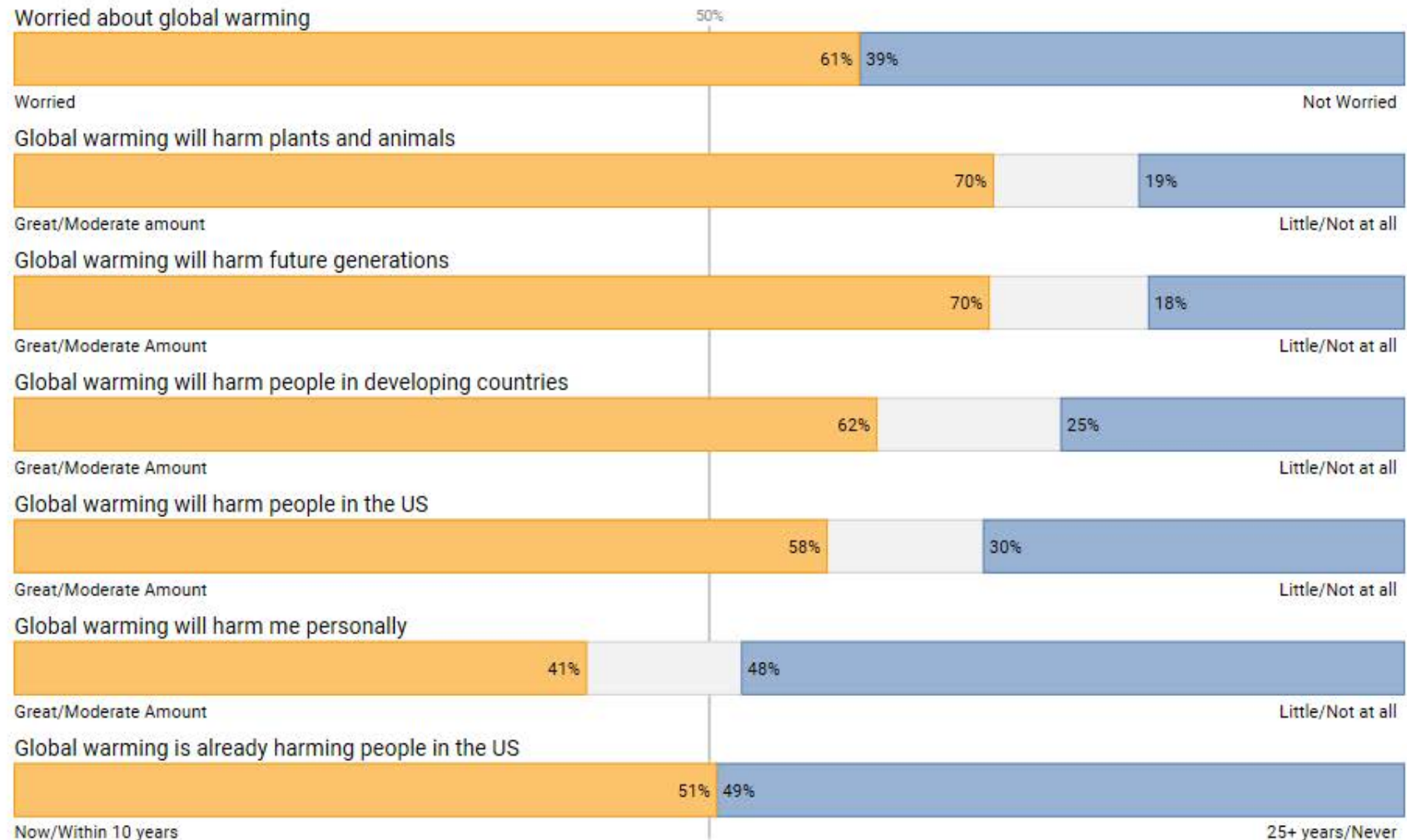


# Global environmental issues force us to confront our tendency to “other” issues

“Marine plastic poses a direct challenge to the basic frameworks of global ethics. These frameworks are dominated by the image of the ‘circle’, an abstract boundary intended to separate ‘humanity’ from the rest of the universe and insulate it against harm. However... marine plastic undermines the ‘circle’”(Mitchell, 2015)

## Our world is a closed system!

## RISK PERCEPTIONS



<https://climatecommunication.yale.edu/visualizations-data/ycom-us-2018/?est=happening&type=value&geo=county>



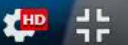
WATCH: Greta Thunberg's full speech to world leaders at UN Climate Action Summit

PBS  
NEWS  
HOUR



0:35 / 5:19

Scroll for details



<https://www.youtube.com/watch?v=KAJsdgTPJpU> (:35-1:25)



Photo: [Washedashore.org](http://Washedashore.org)



## Octavia in front of Union Station, Denver



Photo: [Washedashore.org](http://Washedashore.org)

Art on environmental  
issues, done well,  
enables us to  
recognize ourselves as  
both part of the  
problem and part of  
the solution

Photo: Washedashore.org











Goal: To Develop a framework that combines science and art through education to enable and support collective action

<http://www.insidethegreenhouse.org/shine/>





<https://www.colorado.edu/cumuseum/programs/schools-and-groups/fossils-classroom/materials-and-resources>

# Shine Curriculum Learning Goals:

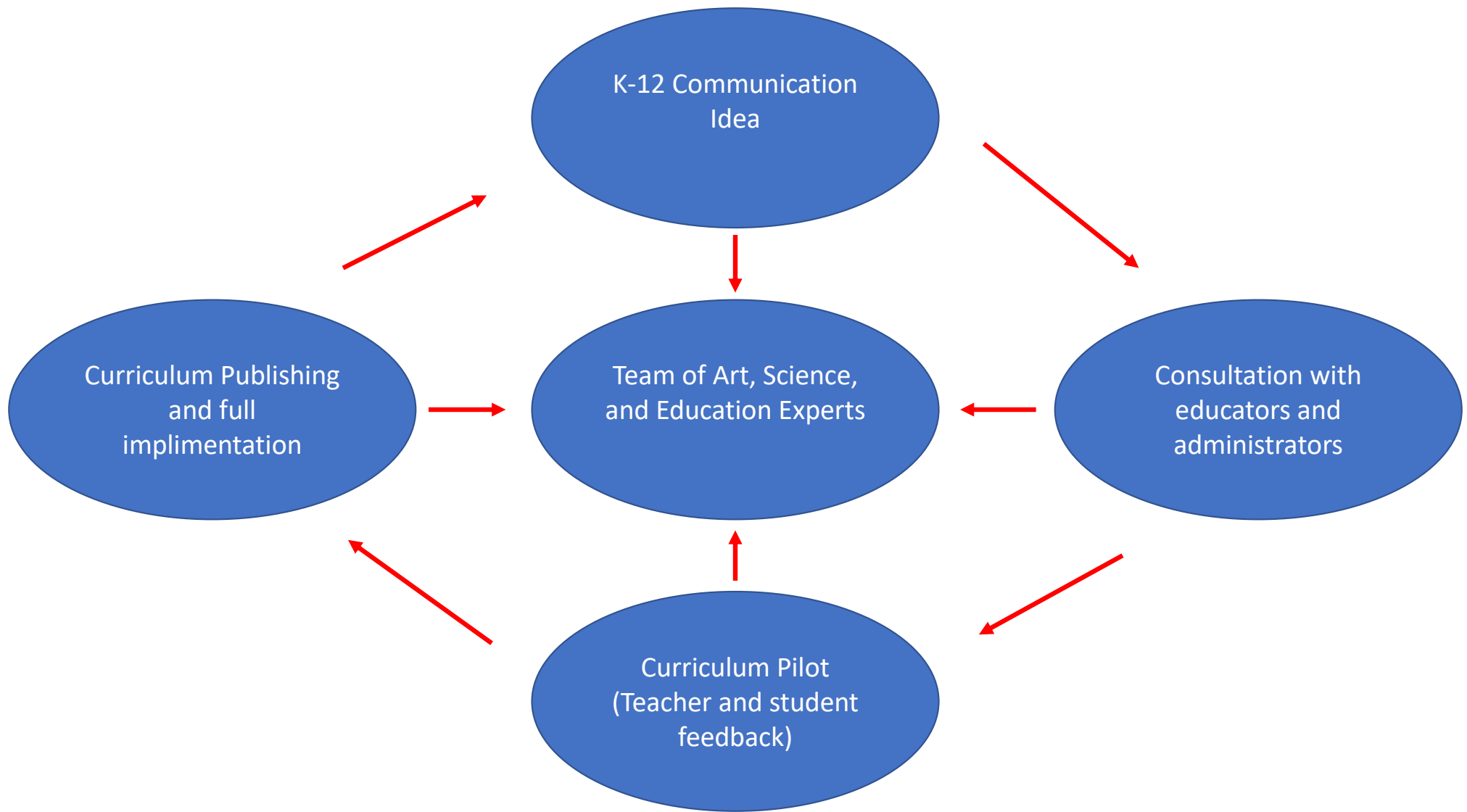
Through lessons and activities in this curriculum students will:

- Understand the relationship between energy and climate
- Place the earth's production of fossil fuels and the impact of human-use of fossil fuels into scale within the last 300,000,000 years of geological history
- Understand how our energy-use is impacting climate
- Engage in effective climate communication
- Understand that the arts can be used to communicate science

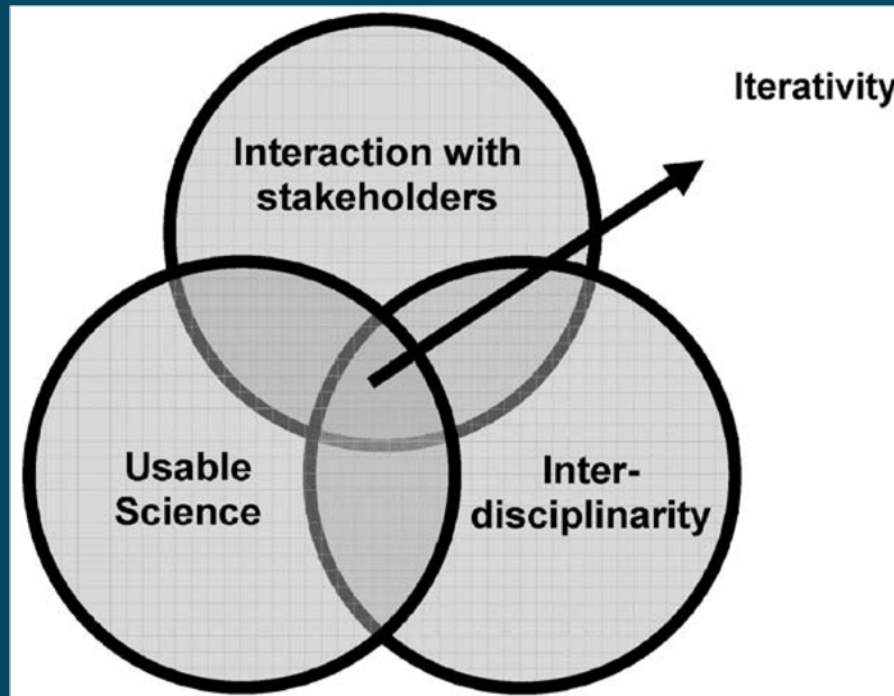
Participatory Performance Learning Goals:

- Embodied learning (See Abrahamson, 2004 for more on embodied learning benefits)
- Nuanced understanding of themes through physical participation in dramatic metaphors
- Youth empowerment
- Civic engagement
- Collaboration with others to effectively communicate youth-authored solutions to an audience
- Students take roles as authors of knowledge and partners in communication to the public





# Combining Science and Art (A co-design framework)



Source: Lemos M, Morehouse B (2005). The co-production of science and policy in integrated climate assessments. *Global Environmental Change*, 15: 57-68.

A criteria for Science/Art Collaboration (based on the Lemos and Moorehouse model for usable science)

Projects Should Have:

1. Stakeholder Engagement
2. Expert Engagement
3. Intentional Impact
4. Iterativity

But Also:

- a. Have appropriate funding
- b. Be realistic about time needed
- c. Respect the integrity of both the arts and sciences



# Art/Science Integration Co-Design Framework for the Creation of the Shine Curriculum

## 1. Stakeholder Engagement:

- Teachers, administrators, and students in Jefferson County
- CU Natural History Museum
- Inside the Greenhouse/ENVS (CU)

## 2. Expert Engagement

- Nationally Renowned Scientists
- Education Experts
- Artists and Musicians

## 3. Intentional Impact

- Community Engagement
- Youth as Authors of Knowledge and Initiators of Action
- Actions for Resilience

## 4. Interativity (Regular Meetings, coordinated work)

## But Also:

- a. Have appropriate funding (So far: CU Office of Outreach and Engagement, ENVS, CU Natural History Museum)
- b. Be realistic about time needed (lots! 2 years complete, 2 more planned)
- c. Respect the integrity of both the arts and sciences


1<sup>st</sup> Curriculum Pilot:

4<sup>th</sup>/5<sup>th</sup> grade

4 teachers

Stober Elementary


Spring 2019



# Shine

## LESSON 1


### Introduction



The creation of this curriculum has been funded in part through Inside the Greenhouse project at CU Boulder

This lesson strives to address NGSS, Colorado 2020 and JeffCo Generations standards and goals, cited at the bottom of the lesson, by communicating science through embodied expression.

Shine, The Musical  
<http://www.insidethegreenhouse.org/shine>



University of Colorado Boulder




Photo of the decorated paperstrips woven into the fabric of community (Credit: Steve Sutton DU/CMO)

### Description

To gain a sense of embodied expression, students will warm up through expressing concepts and ideas through movement. Then, the class will watch the full performance of Shine and discuss the performance in small groups.

### Concepts

- Embodied expression is a unique and powerful form of communication (embodying concepts is beneficial to learners)
- Performance is one form of embodied communication and can be used to consider new ideas and lessons in a way that can be shared.

### Outcomes

Upon Completion of this lesson, students will be able to:

- Identify forms of embodied expression and consider what makes embodied expression unique
- Discuss Shine with peers in terms of the lessons and ideas it offers



# School Visit, March 2019

## What's in it for them?







Culminating Event, Earthday 2019  
Celebrating, sharing, and sustaining what's been created (engagement!)





**PROJECT  
DRAWDOWN.**



email sign up

donate



# THE WORLD'S LEADING RESOURCE FOR CLIMATE SOLUTIONS.

View the solutions

Afforestation

Providing an action context for students: <https://www.drawdown.org/>



Rank	Solution	Sector	TOTAL ATMOSPHERIC CO2-EQ REDUCTION (GT)	NET COST (BILLIONS US \$)	SAVINGS (BILLIONS US \$)
1	Refrigerant Management	Materials	89.74	N/A	\$-902.77
2	Wind Turbines (Onshore)	Electricity Generation	84.60	\$1,225.37	\$7,425.00
3	Reduced Food Waste	Food	70.53	N/A	N/A
4	Plant-Rich Diet	Food	66.11	N/A	N/A
5	Tropical Forests	Land Use	61.23	N/A	N/A
6	Educating Girls	Women and Girls	51.48	N/A	N/A
7	Family Planning	Women and Girls	51.48	N/A	N/A
8	Solar Farms	Electricity Generation	36.90	\$-80.60	\$5,023.84
9	Silvopasture	Food	31.19	\$41.59	\$699.37
10	Rooftop Solar	Electricity Generation	24.60	\$453.14	\$3,457.63
11	Regenerative Agriculture	Food	23.15	\$57.22	\$1,928.10
12	Temperate Forests	Land Use	22.61	N/A	N/A
13	Peatlands	Land Use	21.57	N/A	N/A
14	Tropical Staple Trees	Food	20.19	\$120.07	\$626.97
15	Afforestation	Land Use	18.06	\$29.44	\$392.33

# Plan for 2019/2020 Piloting

- Work with Stober teachers to find “storyline” narratives for lessons that are adaptable
- Redesign and draft curriculum (12 lesson limit)
- Design 2020 workshops with Stober teachers so they can co-lead
- Pilot with four new JeffCo schools (2 of which are 50% free and reduced lunch program)
- Continue iterative meetings with all partners



# Action Challenge!

Plan and cook/design one meal this week without creating food waste. Make it as sustainable as possible. Post your recipe and a picture here in this google drive folder:

<https://drive.google.com/drive/folders/1pPpZplfmGKBGAveLSuaZ3vOL4eflvj21?usp=sharing>

Don't worry, I'll follow-up with an email!



4 tbsp olive oil  
1 large onion  
4 garlic cloves, finely sliced  
250g chargrilled Mediterranean 400g can chopped tomatoes  
1 tbsp small capers  
2 tbsp raisins  
350g rigatoni, penne or another short pasta shape  
bunch basil, leaves picked  
parmesan  
(or vegetarian alternative), shaved, to serve

<https://www.bbcgoodfood.com/recipes/caponata-pasta>

## Further reading/information

- Osnes, B., Boykoff, M. and Chandler, P. (2019) 'Good-Natured Comedy to Enrich Climate Communication' Comedy Studies DOI: 10.1080/2040610X.2019.1623513
- Osnes, B. (2017). *Performance for resilience: Engaging youth on energy and climate through music, movement, and theatre*. Cham, Switzerland: Palgrave Macmillan.
- <https://www.colorado.edu/cumuseum/programs/schools-and-groups/fossils-classroom>
- <https://insidethegreenhouse.org/>
- Boykoff, M. (2019) 'Creative (Climate) Communications: Productive Pathways for Science, Policy and Society' Cambridge University Press. ISBN 9781316646823. 302 pp.

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