



Smithsonian  
Science Education Center

# ***Smithsonian Science for Global Goals. Community Research Guides for Youth to Address the UN Sustainable Development Goals***

Dr. Carol O'Donnell, Director, Smithsonian Science Education Center (SSEC)

©2019 Smithsonian Science Education Center

## Abstract

In 2015, the UNDP identified a series of 17 important worldwide goals referred to as the Sustainable Development Goals (SDGs). These goals make up a blueprint for the future well-being of the planet. In 2016, following a major outbreak of Zika, the IAP SEP, under the leadership of Dato Lee Cheong, decided during the Global Council meeting in Santiago, Chile that education is not only a crucial part of the SDGs due to its role as a specific goal (Goal 4: Quality Education), but it is essential that IAP SEP educate youth on the science of the SDGs to help nations progress on all goals. This presentation discusses how the Smithsonian Science Education Center in collaboration with IAP are developing *Smithsonian Science for Global Goals* Community Research Guides for engaging youth in understanding, discovering, and acting on the world's most

©2019 Smithsonian Science Education Center



Smithsonian  
Science Education Center

## Outline

- ❑ Who are we?
- ❑ *Smithsonian Science for Global Goals*
- ❑ Example *Global Goals* Module: “*Mosquito!*”  
Interactive
- ❑ Implementation Support
- ❑ Closing Video that summarizes the project
- ❑ Questions?

©2019 Smithsonian Science Education Center



# Who are we?

SECTION

1

©2019 Smithsonian Science Education Center



The Smithsonian believes in lifelong experiential learning. Each year, we reach 11M through our educational programming and 33M through museum visits.



<https://www.si.edu/dashboard/public-engagement>



# Our Reach

Smithsonian Science Education 

Timeframe: School Years 2007 - 2018



**39**

K-8 Curriculum Modules  
in Multiple Languages

**20**

Smithsonian Science  
for the Classroom Modules  
plus an Accompanying  
Literacy Series  
Smithsonian Science Stories

**50**

U.S. States  
plus  
Washington,  
DC

**1,698**

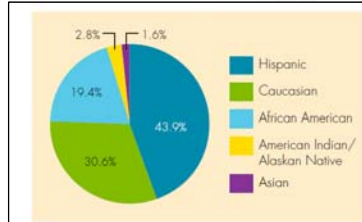
U.S. School  
Districts

**7.3M**

U.S. Students  
Served

**29**

Countries  
Outside  
the U.S.



<https://www.si.edu/dashboard/public-engagement>

©2019 Smithsonian Science Education Center



Smithsonian  
Science Education Center

## Smithsonian Science for Global Goals

SECTION

2

©2019 Smithsonian Science Education Center

What global challenges do our youth face?

Level 2

Level 1

Poverty  
Education  
Digital D  
Urbaniz  
Intellect  
property  
Migratio  
E-Comm  
Biotechn  
Maritime  
Safety  
Pollution

Infectious Disease  
Water Scarcity  
Security  
Security  
financial  
structure  
Change  
rsity and  
n losses  
Fisheries Depletion  
Deforestation

Disrupt our way of life

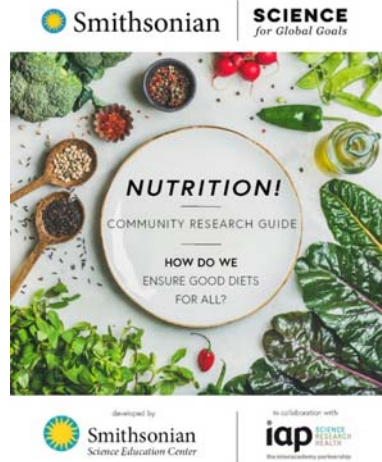
Eliminate our way of life

**The clock is ticking! A six year old today will be in the graduating class of 2030 tomorrow.**

**“Focused actions are needed to lift the 767M people who live on less than \$1.90 per day, and to ensure food security for the 793M people who routinely confront hunger...We need more determined progress towards sustainable energy, and greater investments in sustainable infrastructure. And we need to bring quality education within reach for all...”**

**UN Secretary-General Antonio Guterres**

Smithsonian and IAP are developing free curriculum based on the UN Sustainable Development Goals to empower youth ages 8-17 to use science for social good.



# SUSTAINABLE DEVELOPMENT GOALS

17 goals  
169 targets  
232 indicators  
Lots of science!

1 NO POVERTY  
7 AFFORDABLE AND CLEAN ENERGY  
13 CLIMATE ACTION  
CLEAN WATER AND SANITATION  
2 RESPONSIBLE CONSUMPTION AND PRODUCTION  
SUSTAINABLE DEVELOPMENT GOALS

<https://sustainabledevelopment.un.org/sdgs>



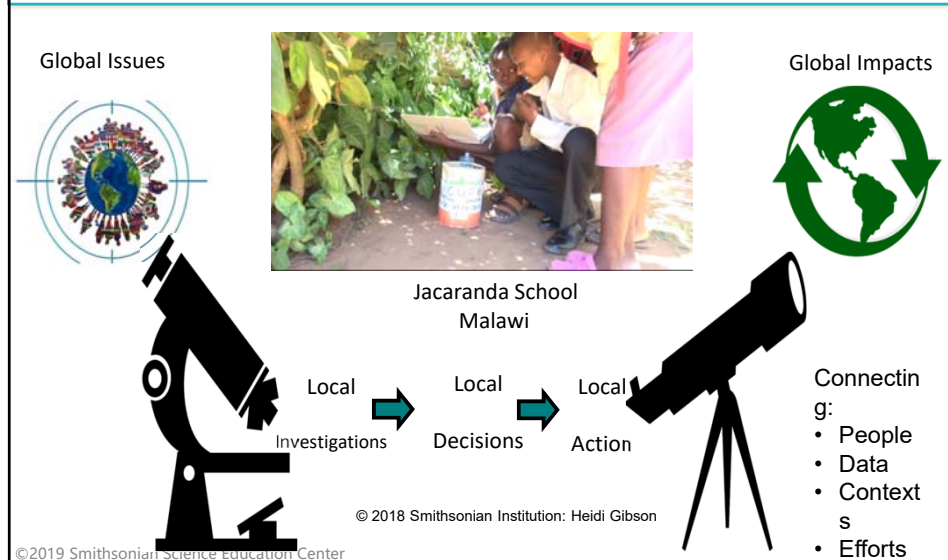
 **Smithsonian** | **SCIENCE**  
*for Global Goals*

**Energy: How do we balance access to energy and environmental concerns?**

**Biotechnology and Humans: How do we balance technology, actions, and ethics?**



We are creating a global learning experience for youth ages 8-17 that is locally relevant but globally important by combining STEM education with civic engagement.





Smithsonian **SCIENCE** for Global Goals

ACT LOCALLY, THINK GLOBALLY.

GORDON AND BETTY **MOORE** FOUNDATION

Johnson & Johnson

Photos Courtesy of Escuela Rafael Maduro Garibaldi, Panama and Escuela San Carlos, Panama





Smithsonian  
Science Education Center

# Example *Global Goals* Module: "Mosquito!" Interactive

---

©2019 Smithsonian Science Education Center

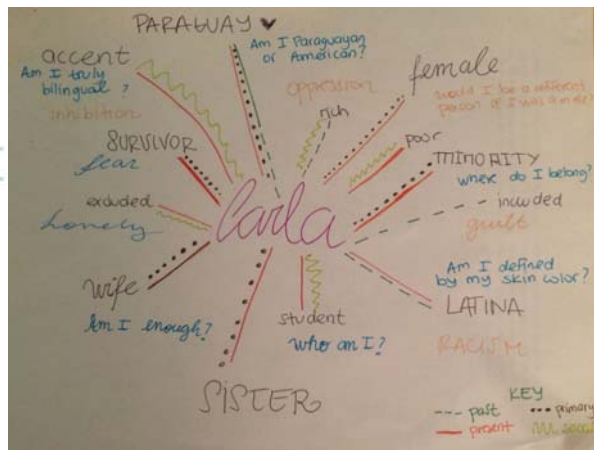
Students begin by building an identity map (and reading the identity maps of scientists so they can see themselves in others). They then add to their map what they know about the complex issue.



**RUSTY LOW**  
SENIOR EARTH SCIENTIST  
Organization:  
Institute for Global Environmental Strategies



**MEERA VENKATESAN**  
MALARIA TECHNICAL ADVISOR  
Organization:  
President's Malaria Initiative, (USAID)



Students examine statements about the issue from multiple perspectives then discuss how they arrive at their decision

Strongly Agree



Strongly Disagree

- It is okay to kill all of the mosquitoes on the planet. (ethical)
- It is important that we have energy to heat our homes, even if it means some harm to the environment. (environmental)
- Cities should be able to control their own waterways, even if other towns get less water downstream. (social)



**SCIENCE**  
*for Global Goals*

The Storyline

- Part 1: Problem
- Part 2: Community
- Part 3: Life Cycle
- Part 4: Transmission
- Part 5: Habitats
- Part 6: Management
- Part 7: Action Plan

We then engage students directly with the science behind the Global Goals—using their community as

## Examples of what students do:



- ❑ Map their community.
- ❑ Determine where mosquitoes live in their community.
- ❑ Investigate how to control the mosquito population near their school, museum, or neighborhood.

Photos: Andre Radloff  
 ©2019 Smithsonian Science Education Center. Students in Panama and Malawi using our "Mosquito!"



## Scientists from diverse backgrounds are highlighted throughout serving as role models to students



**MEERA VENKATESAN**  
 MALARIA TECHNICAL ADVISOR  
 Organization:  
 President's Malaria Initiative, (USAID)



**LEE COHNSTAEDT**  
 RESEARCH ENTOMOLOGIST  
 Organization:  
 United States Department of Agriculture (USDA)



**RUSTY LOW**  
 SENIOR EARTH SCIENTIST  
 Organization:  
 Institute for Global Environmental Strategies



**DAVID PECOR**  
 RESEARCH TECHNICIAN  
 Organization:  
 The Walter Reed Biosystematics Unit (WRBU)



**KELLY BENNETT**  
 BIOLOGIST  
 Organization:  
 Smithsonian Tropical Research Institute (STRI)



**BRIDGET GILES**  
 RESEARCH ASSISTANT PROFESSOR  
 Organization:  
 Virginia Modeling Analysis & Simulation Center at Old Dominion University (VMASC)



# Smithsonian

## SCIENCE


*for Global Goals*

### The Storyline


- Part 1: Problem
- Part 2: Community
- Part 3: Life Cycle
- Part 4: Transmission
- Part 5: Habitats
- Part 6: Management

Students engage in citizen science, map out an action plan, and implement their plan—using their new scientific knowledge to do social good in their community.

## Example Action Plans in



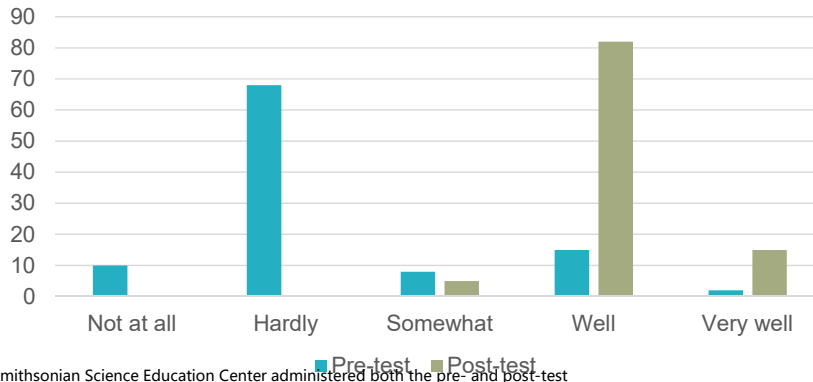
6 year olds collected plastic trash near their school to reduce



17 year olds developed their own mosquito repellent

## What's been our impact? - Content

Question 8: How well do you understand mosquitoes?



The Smithsonian Science Education Center administered both the pre- and post-test for the second round of field testing. For the Our Lady of the Pines Mosquito! module survey, 74 participants completed the pre-test and 84 participants completed the post-test for this item.

©2019 Smithsonian Science Education Center



## What's been our impact? - Agency

Question 29: Use the slider to show your confidence level in your ability to cause change in your local community about local problems?



The Smithsonian Science Education Center administered both the pre- and post-test for the second round of field testing. For the Our Lady of the Pines Mosquito! module survey, 73 participants completed the pre-test and 82 participants completed the post-test for this item.

©2019 Smithsonian Science Education Center







# Implementation Support

©2019 Smithsonian Science Education Center

## Building Awareness for Sustainable Education (BASE)

- ❑ Curriculum alone is not enough.
- ❑ We also host a one day event designed to raise awareness of the complex global issue with local stakeholders.
- ❑ Contextualized for local needs.
- ❑ Engages stakeholders first hand in the topic using hands-on investigations.
- ❑ For example, in Panama, we invited: expert scientists from the Smithsonian Tropical Research Institute (STRI); the Ministry of Education (MEDUCA); the Inter-American Development Bank;



Caption: *Mosquito!* "Building Awareness for Sustainable Education" (BASE) and Professional Development (PD) event in Panama June 2018 held at Smithsonian Tropical Research Institute (STRI) in partnership with MEDUCA, SENACYT, J&J, and IADB.

©2019 Smithsonian Science Education Center

Smithsonian Affiliate Biomuseo, and



## Professional Development

- ❑ Smithsonian Science Education Center then hosts a two-day professional development workshop on the *Global Goals* module for teachers and education leaders from around the region, representing both public and private



©2019 Smithsonian Science Education Center

## Professional Development

- ❑ Smithsonian Science Education Academies for Teachers (SSEATs) include training on existing SSfGGs content.
- ❑ Trained teachers return to home regions to implement **free Global Goals curriculum resources** and share resources with additional teachers in their home school and district.
- ❑ Action plans created by students are then shared amongst teachers.

©2019 Smithsonian Science Education Center

## Next Steps: Fundraising to Continue to Grow the Program

 <p>Nutrition: How do we ensure healthy diets for all? (planned)</p>	 <p>Sustainable Cities: How can we create healthier, happier cities?</p>	 <p>Biotechnology and Humans: How do we balance technology, ethics, and equity?</p>	 <p>Consumption and Production: How do we balance economic and environmental needs?</p>
 <p>Water: How do we balance fair water use for all?</p>	 <p>Humans and the Atmosphere: How do we balance human needs with impact on the atmosphere?</p>	 <p>Biodiversity: How do we balance protecting Earth's diverse resources with human needs?</p>	 <p>Cultural Practices, Equity and Health: How do we balance self-determination, health, and human rights?</p>
 <p>Energy: How do we balance access to energy and environmental concerns?</p>	 <p>Pollution, Environment, and Health: How do we protect human health and ecosystems?</p>	 <p>Agriculture: How do we balance production, economics, and the environment?</p>	 <p>Access: How do we balance supports for individuals with different needs?</p>
 <p>Healthy Ecosystems: How do we balance local ecosystem needs with global implications?</p>	 <p>Weather and People: How do we balance economics and preparation?</p>	 <p>Pandemic: How do we prepare for a pandemic?</p>	 <p>Development and the Oceans: How do we balance today's needs with tomorrow's goals?</p>

## Closing Video, Discussion, and Questions?

<https://public.3.basecamp.com/p/RzCD3yKYXVpPQVx23CDZgA9R>

# Thank you!

---



**Dr. Carol O'Donnell**


*Director, SSEC*

[ODonnellc@si.edu](mailto:ODonnellc@si.edu)

---

Connect with the Smithsonian Science Education Center

 [facebook.com/SmithsonianScienceEducationCenter](https://facebook.com/SmithsonianScienceEducationCenter)

 [twitter.com/SmithsonianScie](https://twitter.com/SmithsonianScie)