Progress Report: IBSE SDG "Zika!" Curriculum

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

Agenda

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- Sustainability Development Goals (SDGs)
- Components
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PARTNERS & GOALS

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Funders

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GORDON AND BETTY MOORE FOUNDATION

Johnson & Johnson

Smithsonian Science Education Center

Development Partners

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Smithsonian Tropical Research Institute

USDA

Smithsonian Learning Lab

WRBU Walter Reed Biosystematics Unit

THE GLOBE PROGRAM

International Partners – InterAcademy Partnership

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IAP membership

More than 130 national, regional and global academies

IAP for Science

IAP for Health
78 members, of which
52 also belong to IAP for Science

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Technical Review Team

Name	Organization
Dr. Bruce Alberts	Chancellor's Leadership Chair in Biochemistry and Biophysics for Science Education, University of CA, San Francisco
Dr. Jorge Allende	Univ of Chile
Dr. William Sullivan	Professor of Molecular, Cell, and Developmental Biology, Univ of California, San Diego
Dr. Norma Nudleman	Univ of Buenos Aires
Shelley Peers	Director Primary Connections, Australian Academy of Sciences
Dr. Lee Cohnstaedt	Research Entomologist, USDA
Dr. Matthew Larsen	STRI, Director (Panama)

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Project Goals

SETTING GOALS

- UN Sustainable Development Goals
- Education for Global Citizenship
- Inquiry-Based Science Education
- Cross-Cutting Concepts

DEVELOPING RESOURCES

- Freely available
- International curriculum resources
- Provide educational experiences on Socio-scientific problems.

BUILDING COMMUNITY

- Resources centered around research of problem and development of relationships within the local community.
- Utilizing citizen science projects to build local and global community.

SERVING PEOPLE

- Goal of program is to empower communities around the world to work proactively towards making those communities healthier and more sustainable places to live.

SUSTAINABILITY DEVELOPMENT GOALS (SDGs)

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Sustainability in science

No single branch of the natural sciences "owns" sustainability; to the contrary, many scholars argue that addressing sustainability will require a new, interdisciplinary field of research (e.g., Clark, 2010).

Focusing solely on the scientific underpinnings of these complex problems might lead students to systematically misinterpret and underestimate the challenges that confront their local, regional, and global communities.

With these concerns in mind…

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Zika

Driving question:

How can we seek to ensure health for our local community from mosquito-borne diseases?

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We are using Four Perspectives




Social	Environmental	Ethical	Economic
Should people who live in places where there is Zika be able to travel?	Are all mosquitoes dangerous to humans?	It is OK to kill all of the mosquitoes on the planet?	What should we do with people who cannot afford to buy bed nets?

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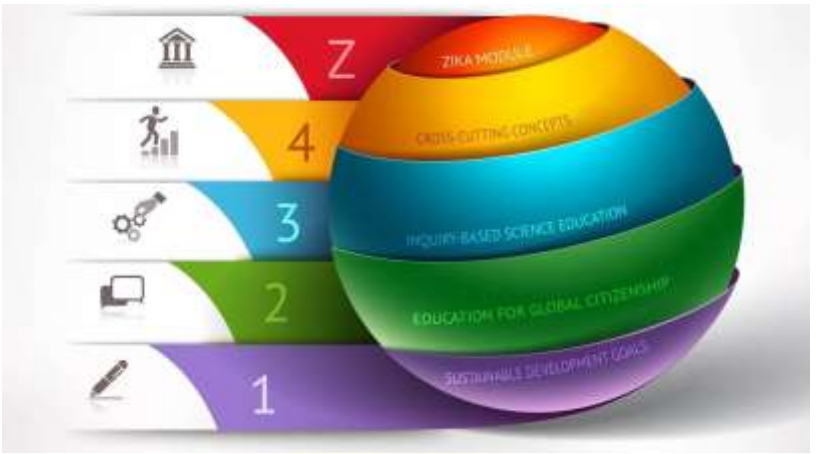
Dimensions of Instruction



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Critical Conversations

What do people in my local community think about mosquito borne diseases? (social)

Where could mosquitoes possibly live in my local community? (environmental)

What are the economic considerations of various mosquito management plans in our community? (economic)

Is it Ok to just kill all of the mosquitoes in our community? (ethical)

Who in my local community has information about this problem? (social)

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COMPONENTS

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Brian

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Essential Module Components

Thinking about problem from multiple perspectives (social, ethical, economic, environmental).

Meeting Researchers with multiple perspectives of the problem.

Engaging in research on local community.

Fostering the growth of student capital and leadership through the building of local community networks.

Getting experience working and making decisions about complex civic problems within a diverse cultural context.

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Meet the Researchers


Task 1-6 Defining the Problem

MEERA VENKATESAN

MALARIA TECHNICAL ADVISOR

Why is the mosquito problem such an important issue for people to understand around the world?

The mosquito is the most dangerous creature on the planet. It causes thousands of deaths. It also makes people, often children, very sick. Even if it is not a problem where you live, it can still have a huge effect on people. One thing we have learned recently is that mosquito-borne diseases can occur anywhere. They also move quickly across the world. Even into places we did not think mosquitoes could survive. Sometimes, diseases like Zika or Chikungunya emerge in places it was not seen before. So, we all must prepare for the future.

Provide a brief description of your work on mosquito borne diseases.

I work on improving the control of malaria. Malaria is the most deadly mosquito-borne disease. Malaria kills around 500,000 people per year. Most of these deaths are kids living in Africa. Luckily, we have many tools to fight malaria that work. The task now is getting them to people in need. We also need them to be used by people at risk. These tools include:

- Tests to know when you have malaria
- Treatments that help sick people
- Bed nets to sleep under
- Spraying insecticides on the walls of homes to keep mosquitoes away

I work at USAID for the President's Malaria Initiative. My work helps countries in Africa and Asia. My work helps these countries with their own local malaria control programs.

Organization:
President's Malaria Initiative, United States Agency for International Development (USAID)

What is on Meera's Identity Map?

SISTER!
FAMILY FROM INDIA!
FRIEND!
VEGETARIAN!
CHOCOLATE LOVER!
STUDENT!
SCIENTIST!
LOVE TO READ!

Student Conducted Community Research

Students map out research site in local community.

Students survey community members within research site to learn more about local misconceptions, understandings, and knowledge about mosquitoes.

Students conduct mosquito, mosquito habitat, animal host and vegetation surveys throughout research site.

Students experiment with collecting and capturing eggs, larva, and pupae to determine distribution in community.

Students conduct anthropological oral histories of community members to understand urbanization changes in their community that have great impact on disease transmission.

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Culminating activity

Having youth develop and communicate a variety of recommendations and suggestions for solutions to the mosquito problem that considers:

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TIMELINE & NEXT STEPS

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Timeline

- Phase I: Engage scientific community to identify research in the field *Jan – April 2017*
- Phase II: Engage international education community to assess current state of education materials *Jan – April*
- Phase III: Curriculum development *May – June*
- Phase IV: Module Layout, Field Test Nationally, Assess Pre- and Post-Module Understanding to Measure Growth *Sept – Dec*
- Phase V: Revise Module Based on Feedback and Assessment, Translate to Spanish, Set up Digital Version *January 2018*
- Phase VI: Conduct Field Test of Spanish Version Internationally *Feb – March*
- Phase VII: Revise and Disseminate Spanish Version Internationally on SSEC, STRI, USDA, IAP/SEP websites *March – April*
- Phase VIII: Translate to other languages *after April* 2018

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Field Testing

Field Testing took place from October 1, 2017 – January 5, 2018 in 19 sites throughout Australia, Indonesia, and the United States.

19 teachers field tested the materials and provided feedback and guidance in a variety of formal and informal education settings at various age levels (ages 8-18).

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Dissemination, Building Awareness, PD

- Public Health Awareness Campaign in Panama (sidewalk billboards, bus signs in Spanish).
- Building Awareness Event with *"Zika!"* Professional Development for 150 educators in Panama.

Learning Lab: Digital Portal for IBSE SDG Online Modules

- There will be an IBSE SDG Landing Page on https://LearningLab.si.edu
- It will contain a mobile friendly version of "Zika!" and other IBSE SDG modules that we develop for IAP SEP.
- This digital portal will allow students to:

  a.) **Discover** - choose from among our 40+ inquiry-based science education (IBSE) lessons we have written for "*Zika!*"; teachers choose lessons that reflect their students' age and local context

  b.) **Create** - personalize the curriculum based on their students' age and local context and add their own images or local stories to the content

  c.) **Share** - share their "collections" of lessons and personalized content with others
- An "embed tool" will allow any IAP partner to upload the IBSE SDG Landing Page to their own website. If the Smithsonian makes any changes to the curriculum, the updates will automatically populate to every website hosting the curriculum landing page.

DESIRED STATE

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Increasing Accessibility

The Zika module will be free

Digital versions will be available on website and other education portals

Distribution network led by IAP, J&J, and other organizations will help widen accessibility to harder to reach areas of world

Zika Mobile App with embedded community survey tools (currently seeking funding) – Transforming the module into a free mobile app will increase accessibility to communities with access only to mobile technology.

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Future Modules

Future modules which utilize the instructional framework developed for Zika!

- Health/Obesity/Nutrition
- Climate Change
- Clean Energy
- Deforestation
- Access to Clean Water
- Responsible Consumption and Production

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