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*Science Education Center*

# ***Vaccines! How can we use science to help our community make decisions about vaccines?***

May 5, 2021

# Welcome!



**Katherine Blanchard**

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# A Couple of Zoom Notes

- ❑ Click the “live transcript” button to turn closed captioning on or off.
- ❑ Please add any questions to the Q&A box. Our staff is monitoring it.
- ❑ Feel free to converse with your fellow participants by choosing “all participants” in the chat.



# What are we doing today?

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1. Brief overview of the Smithsonian Science Education Center and the Smithsonian Science for Global Goals project
2. Introduce you to the *Vaccines!* Community Response Guide
3. Walk you through the guide itself
4. Q&A

# Smithsonian Science Education Center



**Dr. Carol O'Donnell**

*Director*

Smithsonian Science Education Center

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# What is the Smithsonian Science Education Center?

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The image shows the exterior of the Castle of the Smithsonian Institution, a large, multi-story building constructed from reddish-brown stone. The architecture features Gothic Revival elements, including crenellated rooflines, arched windows with diamond-patterned leaded glass, and a prominent entrance with a set of stone steps. The building is surrounded by lush greenery, including palm trees and flowering bushes. A clear blue sky is visible in the background.

# Smithsonian Institution

**The Smithsonian is the world's largest museum, education, and research complex with 19 museums, 5 education centers, 9 research centers, a zoo, with 154 million objects, artworks, and specimens in its collection.**



# The Smithsonian believes in lifelong experiential learning.



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# What is the Smithsonian Science Education Center?

The **Smithsonian Science Education Center** (SSEC) is the only organization within the Smithsonian to focus specifically on formal K-12 STEM education. We serve students, families and caregivers, teachers, schools, school districts, State Education Agencies, and Ministries of Education. We bring object-driven experiential learning to classrooms across the globe.

Jointly founded in 1985:



*National Science Resources Center*

THE NATIONAL ACADEMIES



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Institution



Smithsonian 2010:



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# What is our mission?

Transforming *K-12 Education Through Science™* in collaboration with communities across the globe

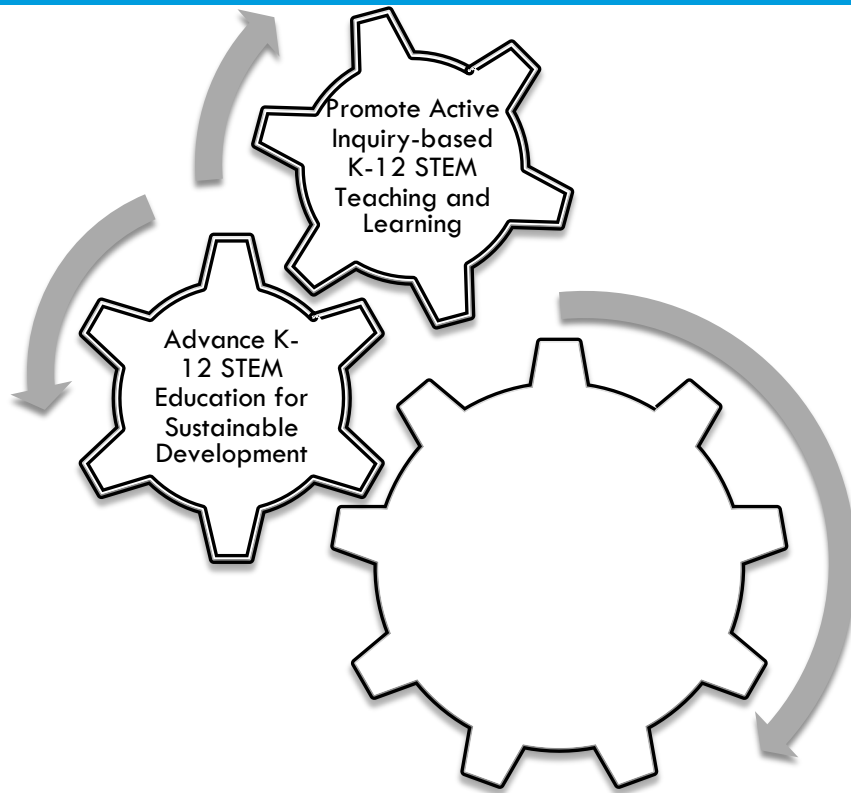


Photos Courtesy of Escuela Rafael  
Maduro Garibaldi, Panama and  
Escuela San Carlos, Panama



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# What are our 3 goals?



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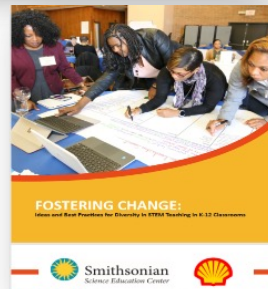
# How do we achieve our goals?



**Curriculum & Communications**

**Professional Services**

- ☐ K-12 curriculum
- ☐ Digital assets (games, videos, simulations)
- ☐ Pan-institutional and external partnerships
- ☐ Professional development
- ☐ Leadership development
- ☐ Systems transformation



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# What is the Smithsonian Science for Global Goals project?

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# What is Smithsonian Science for Global Goals?

- Started January 2016
- Collaboration with IAP
- Supports young people to understand the science and social science of the SDGs and how to take action to address complex global issues.
- Designed for ages 8-17



<https://www.ssec.si.edu/global-goals>



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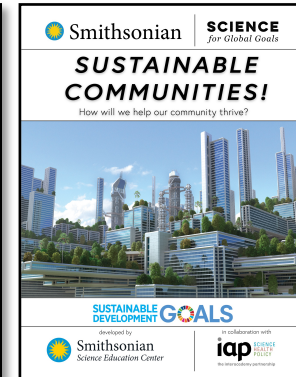
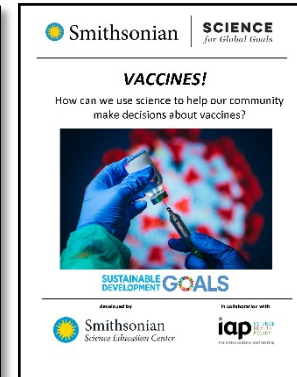
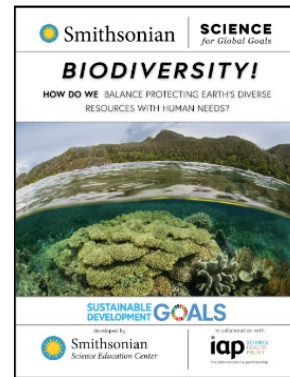
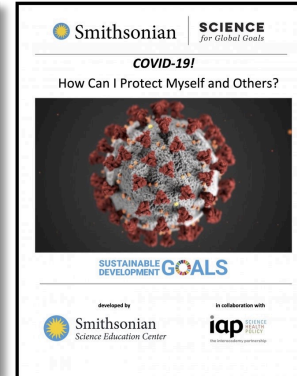
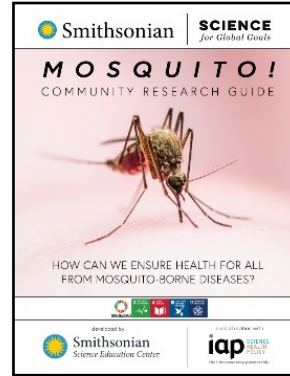




# Smithsonian

## SCIENCE *for Global Goals*

- Young people carry out local investigations on global problems, using their communities as their laboratories.
- They examine the problem through social, environmental, economic, and ethical lenses as they go.
- Ultimately, they take local action to address the issue in their own community.



# Students Discover, Understand, Act

## Discover

Students examine the socio-scientific issue affecting their local and global communities (**social outcomes**)

## Understand

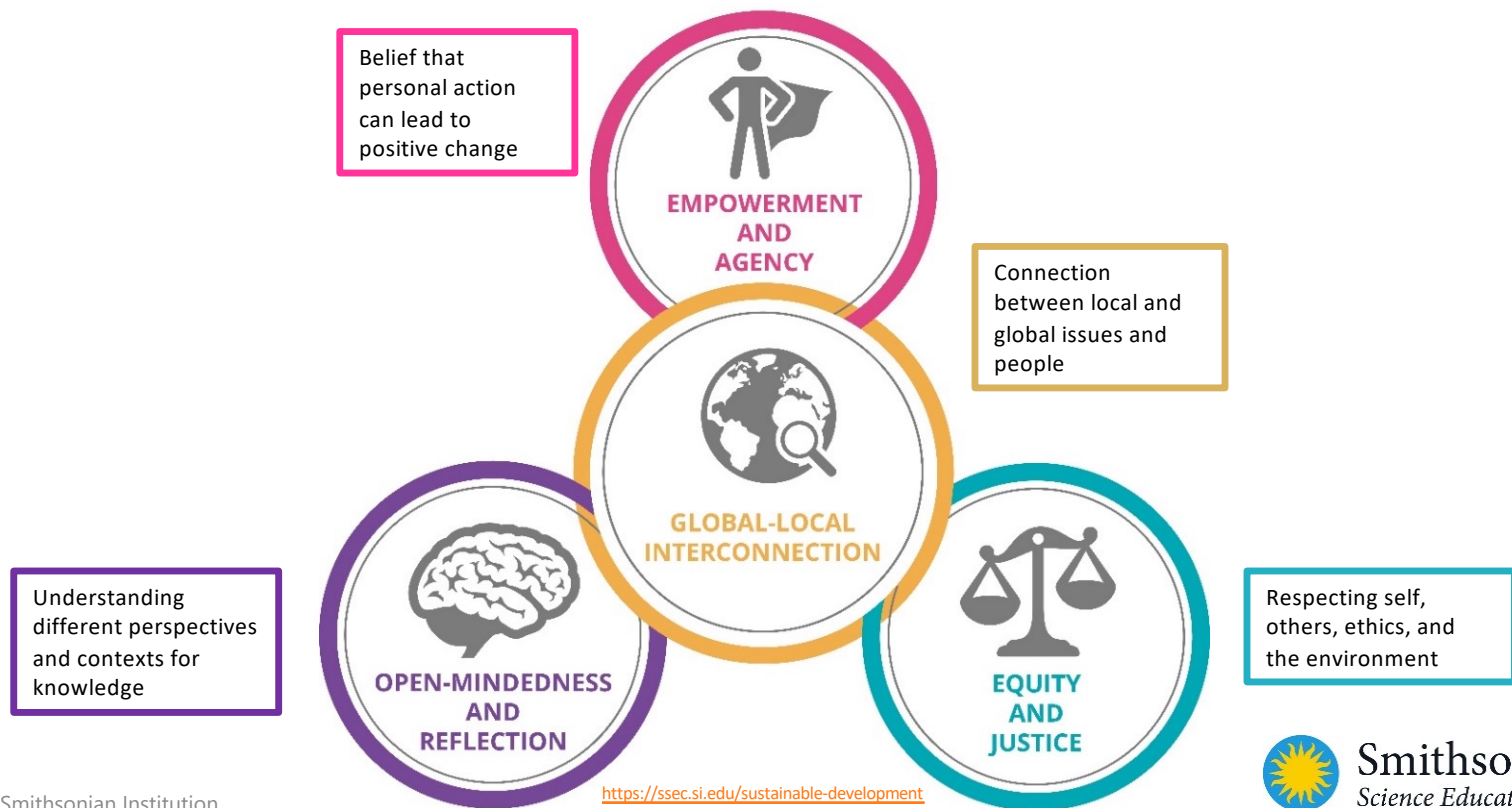
Students investigate the underlying science and social science of the issue using their community as their laboratory (**cognitive outcomes**)

## Act

Students use their new knowledge to do social good (e.g., engineer a plant-based mosquito repellant) (**behavioral outcomes**)

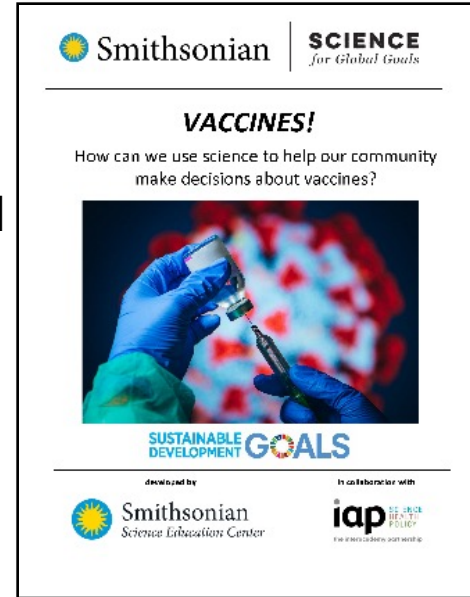


# Goal: Build Students' Sustainability Mindsets



# Why is it important that young people understand vaccines?

- ❑ UN Secretary General called vaccines “the most important public health intervention in history.”
- ❑ “New diseases have emerged at an unprecedented rate of 1 per year for the last 2 decades and this trend will continue.” (WHO)
- ❑ Misinformation about vaccines is common.
- ❑ By educating youth on the history of vaccines, the underlying science of vaccines, how vaccines work, how we know they are safe and effective, and giving them the tools to communicate this science to others, young people can become advocates in their own communities.



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The Smithsonian and other cultural organizations across the nation are collaborating to bring the facts you need to make an informed decision about COVID-19 and vaccines.

📌 Pinned Tweet



**Smithsonian Science Education Center** @Smithsoni... · May 21, 2020 ...

We collaborated with @WHO and @IAPartnership to develop, "COVID-19! How can I protect myself and others?". This guide integrates inquiry-based science education with social and emotional learning and civic engagement. For ages 8-17. [s.si.edu/3b5cL4N](https://s.si.edu/3b5cL4N) #SSfGG #SmithsonianEdu



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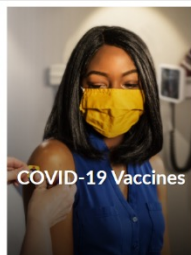


## VACCINES&US

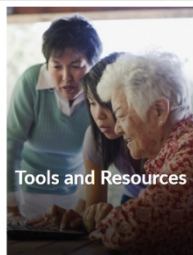
Cultural Organizations *for* Community Health



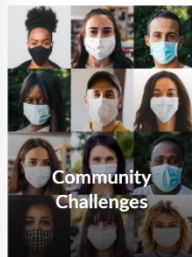
COVID-19 Science



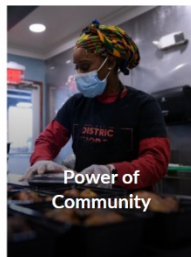
COVID-19 Vaccines



Tools and Resources



Community Challenges



Power of Community



COVID-19 and History

<https://vaccinesandus.org>

[#VaccinesAndUS](https://vaccinesandus.org)



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# How can you use this guide?

*Exploring the content*

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# Accessing the Materials


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**SCIENCE**  
*for Global Goals*

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**VACCINES!**

How can we use science to help our community make decisions about vaccines?



**SUSTAINABLE DEVELOPMENT GOALS**

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developed by

**iap** SCIENCE  
HEALTH  
POLICY  
the interacademy partnership

in collaboration with

 <https://ssec.si.edu/vaccines>



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# Frequently Asked Questions

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What ages is this designed for?	8-17 years old
How long will it take to complete?	8-12 hours
Do young people use this in a group?	It can be a classroom or group project, or done independently at home
Can children do this at home?	Absolutely! It is a great intergenerational project.
Do I have to pay to use it?	Nope. Smithsonian Science for Global Goals is always free!
Why doesn't it look like the other Smithsonian Science for Global Goals modules?	<ol style="list-style-type: none"><li>1. Quick translation</li><li>2. Quick distribution</li><li>3. Ease of adaptation</li></ol>
What languages is it available in?	English: Available Now! Spanish: Available by June 1 Brazilian Portuguese, Arabic, and Vietnamese: Coming soon <i>NOTE: If you are interested in translating these materials, please reach out to Katherine!</i>

# Includes Features such as....

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- ❑ Accessible pdf delivery and ideas for differentiation and changes based on the needs of the users
- ❑ Consistent structure and glossary to help scaffold understanding
- ❑ Letter addressed directly to students to engage them to self-direct this work
- ❑ Call-out boxes with information on methods and scientific content
- ❑ Support for young people to plan their own actions
- ❑ StoryMap extension with additional resources and quotes from experts

# Who Do Students Learn From?

- ❑ A range of experts including:
  - Doctors and practitioners
  - Public health experts
  - Researchers
- ❑ These experts represent:
  - The World Health Organization
  - Johns Hopkins, Emory, and Morehouse School of Med. , USA
  - Bryce Institute for Indigenous Health, Canada
  - Fiocruz Foundation, Brazil

# Meet the Developers



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**Hannah Osborn**

*Lead Product Specialist*  
OsbornH@si.edu

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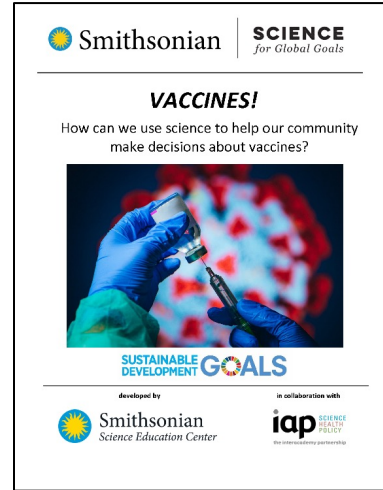
# Breaking Down the Tasks

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# ***Vaccines! How can we use science to help our community make decisions about vaccines?***

- ❑ Task 1: How does my community think and feel about vaccines?
- ❑ Task 2: Why are vaccines important? The history of vaccines.
- ❑ Task 3: How do vaccines work?
- ❑ Task 4: How do we know vaccines are safe?
- ❑ Task 5: How do we know vaccines work?
- ❑ Task 6: How should we make decisions about vaccines?
- ❑ Task 7: How do I get information about vaccines?
- ❑ Task 8: How can I share the science of vaccines with others?



# Task 1: How does my community think and feel about vaccines?

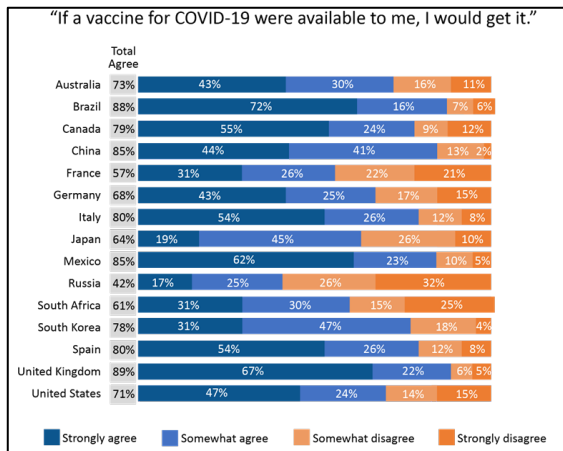
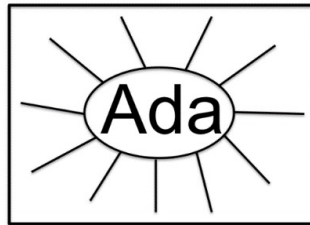
- ❑ Young people are empowered by starting with themselves: considering their own identity, existing knowledge, and opinions
- ❑ Through survey tools, young people understand the opinions and concerns about vaccines in their communities so they can help address them using the science they learn in the guide

**Growing up in a community, the community molds us. If you want to change people's behavior, you need to be aware of where people are coming from, from a cultural standpoint. The first thing you have to ask is, "What is the concern?" Talk to the community to understand what the concern is. Don't make an assumption. First hear the community. Then align the communication to the concerns of the community. —Dr. Panagis Galiatsatos, MD, MHS**



# Task 1: How does my community think and feel about vaccines?

- ❑ **Discover:** How does my identity relate to what I think and feel, and how I make decisions about vaccines?
- ❑ **Understand:** What do others think and feel about vaccines?
- ❑ **Act:** How should I make decisions about vaccines?



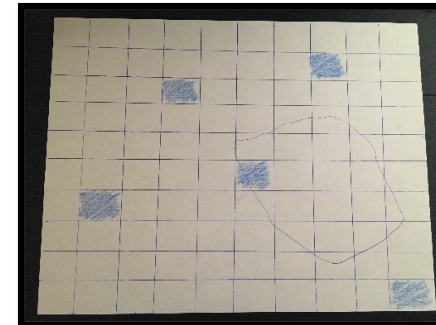
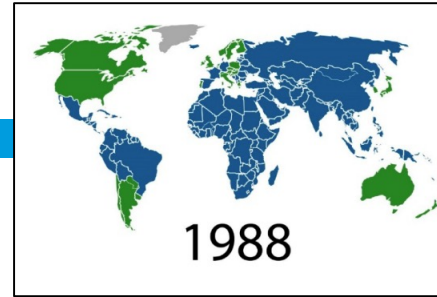
# Task 2: Why are vaccines important?

- ❑ Establish a foundation of diseases that young people know about and what diseases those in their household know about
- ❑ Understand the impact of vaccines on the global community through analysis of maps before and after vaccination programs
- ❑ Understand herd immunity through modeling



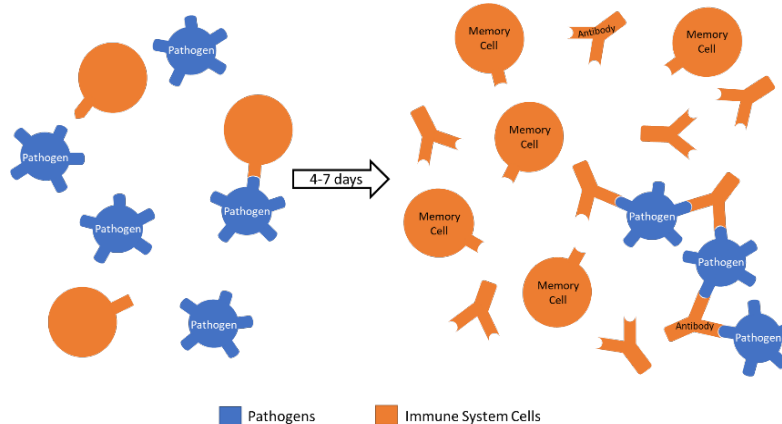
## Task 2: Why are vaccines important?

- ❑ **Discover:** What do I know about diseases that now have vaccines?
- ❑ **Understand:** In the past, how did vaccines affect diseases?
- ❑ **Act:** What is my responsibility to myself and others?



# Task 3: How do vaccines work?

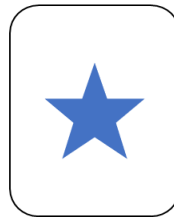
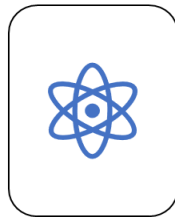
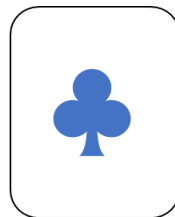
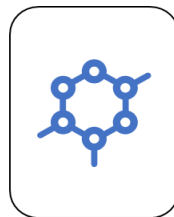
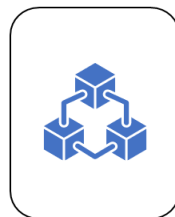
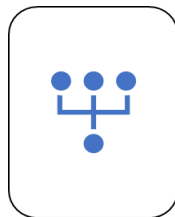
- ❑ Develop an understanding of the human body's natural defenses against disease
- ❑ Understand how vaccines activate the human body's natural defenses to fight specific pathogens





# Task 3: How do vaccines work?

- ☐ **Discover:** How does my body protect me?
- ☐ **Understand:** How do vaccines teach my body to recognize threats?
- ☐ **Act:** How can I share information about how vaccines work?



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# Task 4: How do we know vaccines are safe?

- ❑ Develop an understanding of clinical trials
- ❑ Examine information and decide if it would make for a good clinical trial

Clinical trial	Number of participants	Race of participants	Age range of participants
A	More than 40,000	American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White, Multiracial	18 to 100 years old
B	More than 40,000	American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White, Multiracial	16 to 91 years old
C	More than 30,000	American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or other Pacific Islander, White, Multiracial	18 to 95 years old



# Task 4: How do we know vaccines are safe?

- |   | Least Safe | Most Safe |
|---|------------|-----------|
| <input type="checkbox"/> <b>Discover:</b> How do I decide if something is safe?                     |            |           |
| <input type="checkbox"/> <b>Understand:</b> How do we make sure vaccines are safe?                  |            |           |
| <input type="checkbox"/> <b>Act:</b> How can I help my community understand the safety of vaccines? |            |           |

## Phases of a Clinical Trial for a Vaccine

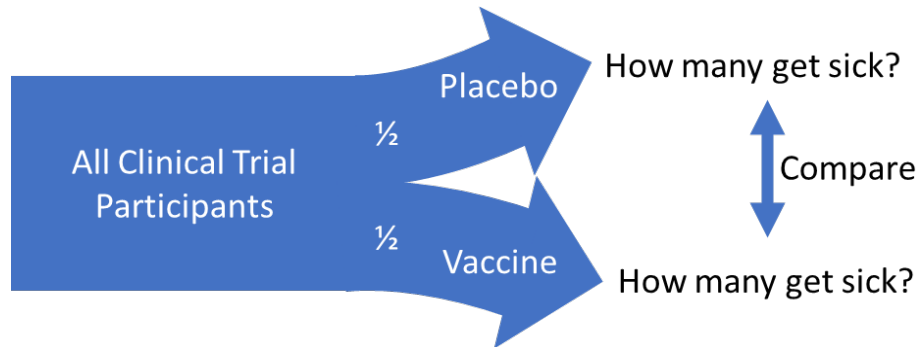
Each clinical trial for a vaccine has four phases. Different things happen in each phase, but every phase of a clinical trial has:

- **Participants:** These are the people who are part of a clinical trial. They are always volunteers, meaning that they choose to be a part of the clinical trial.
- **Researchers:** These are the people who plan and carry out the clinical trial.  
**Informed consent:** In each phase, the researchers explain the risks of being in a clinical trial to the participants. Then, the participants sign a form saying that they understand the risks. This is called informed consent. Participants can leave the trial at any time if they change their mind.



# Task 5: How do we know vaccines work?

- ❑ Build upon their knowledge of clinical trials to understand how placebo and vaccine groups are used to calculate if a vaccine works
- ❑ Use data from a clinical trial to understand vaccine efficacy and model how well a COVID-19 vaccine works



# Task 5: How do we know vaccines work?

- ❑ **Discover:** How do we know a vaccine is working?
- ❑ **Understand:** How do we know vaccines work?
- ❑ **Act:** How can I explain to others about how we know vaccines work?

Score	Type of COVID-19 sickness	Score	Type of COVID-19 sickness	Score	Type of COVID-19 sickness
4	Not Sick	11	Not Sick	18	Mild
5	Not Sick	12	Not Sick	19	Mild
6	Not Sick	13	Not Sick	20	Mild
7	Not Sick	14	Not Sick	21	Mild
8	Not Sick	15	Not Sick	22	Mild
9	Not Sick	16	Not Sick	23	Mild
10	Not Sick	17	Not Sick	24	Mild

# Task 6: How should we make decisions about vaccines?

- ❑ Empathetically think about how different experiences and needs may lead to different opinions and require different ways of communicating
- ❑ Consider local and global equity and access

Sometimes we are afraid of things because they are new, and we don't understand them. Sometimes we are afraid of things because we've heard from someone we love that something is scary and we're taking that on. Sometimes we've heard about side effects. There have been groups of people around the world who have had governments or medicine experiment on them in a way that's not in their best interest. It's totally understandable that they wouldn't trust. That has to be addressed and looked at from a space of compassion. —Dr. Anne McDonough, MD, MPH, MA



# Task 6: How should we make decisions about vaccines?

- ❑ **Discover:** What affects the health decisions we make?
- ❑ **Understand:** What is important to consider when making decisions about vaccines?
- ❑ **Act:** How can we make good decisions about vaccines?

Risk for COVID-19 Infection, Hospitalization, and Death by Age Group							
Rate compared to 5-to-17-year-olds	18–29 years old	30–39 years old	40–49 years old	50–64 years old	65–74 years old	75–85 years old	85+ years old
Cases	2x	2x	2x	2x	1x	1x	2x
Hospitalization	6x	10x	15x	25x	40x	65x	95x
Death	10x	45x	130x	440x	1,300x	3,200x	8,700x

# Task 7: How do I get information about vaccines?

- ❑ Critical thinking and analysis of information sources
- ❑ Giving young people the tools to examine sources and think about misinformation

**Young people have a lot of power. They can influence and educate less-informed community members. Young people can break the chain of false information on vaccines by verifying vaccine information on social media and not sharing false information. They can use technology as a tool to promote behavior change communication. —Dr. Mary Ashinyo, MD, MPH**





# Task 7: How do I get information about vaccines?

## How to Evaluate a Source

Consider one piece of information at a time. You and everyone on the team should read, listen to, or view the piece of information you are evaluating. Answer the following questions on your own or with your team.

### Age

- Does this information list the date it was created?
- Was this information created recently?

### Style

- Does the information seem neat and organized?
- Is the spelling and grammar correct?

### Author

- Who created this information?
- Is the author's name in a place where you can easily find it?
- Is there information about the author?
- Does the author know a lot about this subject, or did they include information from people who do?

### Data

- Does this piece of information include data?
- Where does the data come from? Is that source listed?
- Can you check the data yourself?

### How does the information make you feel?

- Does this information have words, images, or sounds that make you feel intense emotions, such as angry, scared, or upset?
- Does it use loud voices, capital letters, or exclamation points?
- Does it feel like the information is trying to get you to take a side?

- ❑ **Discover:** Where do I get my information?
- ❑ **Understand:** How can I tell what information is accurate?
- ❑ **Act:** How can I help my community get accurate information?

# Task 8: How can I share the science of vaccines with others?

- ❑ Students develop and carry out their own integrated action plan
- ❑ Young people can use their established relationships within the communities they are part of to pass on scientifically accurate information about vaccines and directly address the concerns of the people around them
- ❑ Young people start to see themselves as changemakers

# Task 8: How can I share the science of vaccines with others?

- ❑ **Discover:** What have I learned about vaccines that I can share?
- ❑ **Understand:** How can I make a plan to share information with my community?
- ❑ **Act:** How can I continue to help others in my community?

1. Think about the information you marked in your Community Concerns list.
  - a. What are some ways you already shared this information in the Act activities of this guide?
  - b. Are there other ways you could share this information?
  - c. Knowing what you do about your community, what ways of communicating might be best? For example, you could use social media, create a visual art piece, speak with people individually, perform a play or dance, design a poster, or use another method.



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# What's Next?

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# Join us for next week's webinar!

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- ❑ Two webinars on Thursday, May 13
  - 9:00am and 5:30pm Eastern
- ❑ Opportunity to ask the developers your questions, and see some of the activities in action.
- ❑ Registration is available at:  
[www.ssec.si.edu/event/vaccines](http://www.ssec.si.edu/event/vaccines)

# Share What You Do!

- ❑ Form available to collect dissemination data:  
<https://forms.office.com/r/bR97F31Cjd>
- ❑ Send photographs, videos or written testimonials through email to [blanchardkp@si.edu](mailto:blanchardkp@si.edu). Please provide permissions to share this material.
- ❑ Tag us: #SSfGG
  - Facebook - @SmithsonianScienceEducationCenter
  - Twitter & Instagram - @SmithsonianScie



# We are here to support you

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- ❑ If you are looking to use *Vaccines!* with your students or your community and are interested in additional training or support, please reach out to Katherine at [BlanchardKP@si.edu](mailto:BlanchardKP@si.edu)
- ❑ We will be offering additional support and content around the *Vaccines!* guide in the coming months, so please make sure you are signed up for our mailing list!



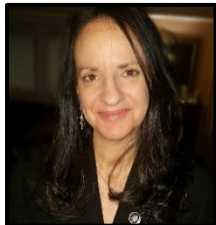
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# Q&A

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# Thank You!



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