

“Can You Talk Climate” Outline

Overview

An outline for a lesson for educators to be able to instruct students about climate research methods. This lesson centers around creating quality research and good data. It is designed as an interactive presentation where the educator lectures and two activities are interspersed for the students to practice the method and use the material they just learned. The activities focus on creating a hypothesis and research project and trying to convince an assigned person why the individual should promote their project or take action. Originally designed to present at a youth climate summit, the presentation engages the students with several activities that make the students think critically with new climate research methods and tools.

Subject:

Science

Suggested Levels:

Middle School/High School

Learning Objectives:

- Explain what qualifies as “good research”
- Understand the biases and heuristics of individuals
- Understand the difference between correlation and causation
- How to interpret and utilize research results
- How to design a research project
- How to communicate your research results to others and the importance of clear communication

NGSS:

[MS-ETS1-4 Engineering Design Activity](#)

[MS-ETS1-3 Engineering Design Activity](#)

[MS-ESS3-2 Earth and Human Activity](#)

[MS-ESS3-3 Earth and Human Activity](#)

Materials Needed:

- Paper or whiteboard
- Pens or markers

Background Information:

This lesson focuses on decision making and communication. The example proposal topics for the students are centered around climate issues and are New York specific but the instructor can change the individuals and New York specific topics to better fit an environment that will engage their students.

Additional Reading/Resources:

Clean Tap Water in NYC Boroughs

<https://newyork.cbslocal.com/2019/05/14/brown-water-five-towns-area/>

<https://www.nbcnewyork.com/news/local/washington-heights-inwood-brown-water-faucets-manhattan/997825/>

<https://www.smithsonianmag.com/history/how-new-york-city-found-clean-water-180973571/>

NYC Plastic Bag Ban

<https://newyork.cbslocal.com/2020/09/18/enforcement-of-plastic-bag-ban-will-begin-oct-19-in-new-york-officials-say/>

<https://www.cnn.com/2020/02/28/us/new-york-plastic-bag-ban-trnd/index.html>

Oil Industry Impacting Wildlife

<https://www.oiledwildlife.eu/background-information/why-respond-wildlife-affected-oil-and-other-hazards/effects-oil-wildlife>

https://wildlife.org/wp-content/uploads/2014/05/Oil-and-Gas-Technical-Review_2012.pdf

<https://www.resilience.org/stories/2020-06-04/20000-ton-oil-spill-in-russian-arctic-has-catastrophic-consequences-for-wildlife/>

Impacts of Rising Temperature and/or Rainfall on US Agriculture

<https://www.nytimes.com/2019/04/30/dining/farming-climate-change.html>

<https://www.washingtonpost.com/news/energy-environment/wp/2017/01/19/yet-another-study-suggests-that-climate-change-will-hurt-crops-more-than-it-helps-them/>

<https://projects.propublica.org/climate-migration/>

Individual Descriptions

https://docs.google.com/document/d/10xT1cn0izWj_oeiPCo7X6jWOeT9EPGu5JoQxxAMFnTA/edit?usp=sharing

Activity 1- “Data Analysis”

Time Required: 5 minutes

Students look at the data provided on the slides and think about what makes this good research, what it is telling us, analyze the data, and explain why it looks that way.

add data quality as an activity; what makes good research, initial questions, analyze the data, what is it telling us, why it looks that way**

Activity 2 - “Design a Research Project”

Time Required: 20 minutes

Students will get into groups of 3-4 people and be assigned a research topic. The group will design a hypothesis and research proposal. Students should identify who will benefit from the research and how they benefit. Lastly, the group should identify the type of data needed to conduct the project and how to acquire that data. The educator should encourage the students to use whatever resources and tools they want to complete this activity and to walk around while the students collaborate to moderate or see if they need any help.

Activity 3 - “Communicating Your Report”

Time Required: 15 minutes (depending on group sizes/time constraints)

This activity focuses on communicating their research to a member of the general public. Students within their groups come up with a short proposal to persuade this assigned individual to fund their project. Due to time constraints, the instructor should walk around to answer any questions about how the students should pitch their proposal to their individual. The individuals chosen for this activity are Bill de Blasio, Susan Collins, Marisol Rosales, and Jimmy Fallon and descriptions about their background information are in the “Additional Materials” section.

Discussion/Wrap Up

The educator should emphasize the importance of proper communication. It isn't enough to present quality research if no one understands what the research is.

1. What did each group take into consideration when trying to present their research to their assigned individual? Why do you need to take things like this into consideration?
2. How do biases/heuristics affect our lives outside of a research context? Did you expect biases/heuristics to play such a big role in our lives? How can you overcome biases?
3. Were you surprised by all the different components involved in research and creating good data?
4. Can you think of any recent news stories involving research or data sets? Can you think of any questions you would want to ask the researchers to see if their data is “good”?
5. Is there anything you are confused about? Do you feel that you could explain to someone else research methods and good data?

Connections with Other Subjects

This presentation can be applied to a multitude of subjects.

Psychology→ A portion of this presentation focuses on heuristics and biases which the students need to know in order to properly communicate their climate research to the public. It is key to climate communication to understand how to communicate research while taking into account the heuristics and biases of the public and any psychology course can emphasize and expand on these topics in more detail.

Designing a Research Project:

1. Define a hypothesis and research proposal for your topic.
2. Identify who will benefit from your research and how.
3. Identify what data you will need to conduct the project and how to get it.
4. Figure out what tools or resources you will need for the experiment.

Project Ideas

- Clean tap water in NYC Burroughs – brown water seen coming out of faucets (more information can be found [here](#))
- NYC plastic bag ban (more information can be found [here](#))
- How the oil industry impacts wildlife in the US (more information can be found [here](#))
- The impacts of rising temperatures and/or rainfall on US agriculture (more information can be found [here](#))

Heuristics and Biases

Halo Effect: The “don’t judge a book by its cover” heuristic. This is the tendency for positive impressions of a person, company, brand or product in one particular area, such as appearance, to positively influence one's opinion or feelings in other areas. For example, an individual’s opinion of another person tends to be influenced by their previous judgments of that person’s performance or personality.

Affinity Bias: This bias explains that individuals like to be with people who are similar to themselves, whether they have similar race or gender or if they are on the same soccer team, in the math club, or in the same theater production.

Anchoring Bias: This is when an individual depends too heavily on an initial piece of information they received and subsequently makes judgements based on this information in decision making. Once this “anchor” information is set all future arguments, negotiations, estimates, and decisions are discussed in relation to the anchoring information.

Availability Heuristic: This is a mental shortcut, a quick snap judgement, that is based on immediate examples (from personal experience) that come to an individual’s mind when evaluating a certain topic, idea, method or decision.

Communicating Your Project:

Based on what you have learned about communication, biases, and heuristics, come up with a short, but well thought out proposal as to why you think your selected individual should adopt your project/results and make a change in your community.