

Introduction

The non-profit EarthTalk created its Q&A project to leverage the power of syndicated media to promote environmental literacy, green living and climate mitigation. Professional journalists research and answer real reader questions on a range of environmental topics, citing experts and peer-reviewed research in the process of producing concise, easy-to-read explanations of the issues at hand—and what readers can do to help. The resulting “answers” are then distributed for re-publication to 1,200+ other media outlets, reaching some 30 million readers collectively every week.

EarthTalk in the Classroom brings the process of researching and answering environmental questions to students, building collective understanding of complex environmental issues in their own communities. Students work together to make observations, develop critical questions, research, and then share their work with others, promoting environmental literacy and awareness.

These modules break down the EarthTalk Q&A process into smaller components, which can be used in sequence or individually to support preexisting science curriculum and to fit the needs of students, and can serve as supplemental resources to middle school environmental and social sciences curriculum.

Part 3: Communicating Your Results

In the previous modules, students created their guiding research question and explored sources to help them find answers. In Part 3 students organize their findings and create compelling answers to their research question. In Module 6 students create a concept map of their findings. Once students have identified their most relevant findings, they create an outline for their answer in Module 7. Module 8 tasks students to craft their final answer, assembling relevant information, quotes, and transitions into a clear and concise short essay following the EarthTalk format.

Learning Objectives

Student-generated Research

- Students will be able to make observations about their environment, both built and natural.
- Students will be able to ask questions that clarify observations or evidence.
- Students will be able to find resources to find answers to their research questions.
- Students will be able to compare and critique multiple arguments, and analyze or interpret facts presented to evaluate claims.
- Students will be able to explain what makes a good resource, evaluating sources for clarity, relevance, and bias.

Communicating and Distributing Results

- Students will be able to write informative short essay relevant to their research question, using the EarthTalk Q&A format.
- Students will be able to cite specific textual evidence to support analysis of sources.
- Students will be able to adhere to fairness in reporting and journalistic objectivity standards.

Environmental Justice

- Students will be able to make connections between phenomenon observed and the impact of human actions, infrastructure, and institutions.
- Students will be able to identify how local systems (ecosystems, communities, and economies) are affected by observed phenomenon, and explain various stakeholder perspectives.
- Students will be able to explain how communities, organizations, and governments can affect positive change within their community.

Learning Standards

These modules support middle school learning performance expectations, as identified by the Next Generation Science Standards (NGSS); the English Language Arts Standards of the Common Core State Standards (CCSS); and Washington State's Environment and Sustainability Learning Standards (ESE).

Common Core State Standards

CCSS.ELA-LITERACY.WHST.6-8.1 Write arguments focused on discipline-specific content.

CCSS.ELA-LITERACY.WHST.6-8.4 Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

CCSS.ELA-LITERACY.WHST.6-8.7 Conduct short research projects to answer a question, drawing on several sources and generating additional related, focused questions that allow for multiple avenues of exploration.

CCSS.ELA-LITERACY.WHST.6-8.9
Draw evidence from informational texts to support analysis, reflection, and research.

Next Generation Science Standards

Part Three of EarthTalk in the Classroom supports Middle School Next Generation Science Standards, primarily through the implementation of several Science and Engineering Practices in student research. Depending on their research topic, students will also implement one or more Crosscutting Concepts and Disciplinary Core Ideas such as Earth and Space Sciences and Life Sciences.

Science and Engineering Practices

- **Constructing Explanations and Designing Solutions**
 - Construct a scientific explanation based on valid and reliable evidence obtained from sources (including the students' own experiments).
 - Apply scientific ideas, principles, and/or evidence to construct, revise and/or use an explanation for real-world phenomena, examples, or events.
 - Apply scientific reasoning to show why the data or evidence is adequate for the explanation or conclusion.
- **Engaging in Argument from Evidence**
 - Compare and critique two arguments on the same topic and analyze whether they emphasize similar or different evidence and/or interpretations of facts.
 - Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support or refute an explanation or a model for a phenomenon or a solution to a problem.
- **Obtaining, Evaluating, and Communicating Information**
 - Communicate scientific and/or technical information (e.g. about a proposed object, tool, process, system) in writing and/or through oral presentations.

Environmental Learning Standards

ESE Standard 1: Ecological, Social, and Economic Systems. Students develop knowledge of the interconnections and interdependency of ecological, social, and economic systems. They demonstrate understanding of how the health of these systems determines the sustainability of natural and human communities at local, regional, national, and global levels.

ESE Standard 2: The Natural and Built Environment. Students engage in inquiry and systems thinking and use information gained through learning experiences in, about, and for the environment to understand the structure, components, and processes of natural and human-built environments.

ESE Standard 3: Sustainability and Civic Responsibility. Students develop and apply the knowledge, perspective, vision, skills, and habits of mind necessary to make personal and collective decisions and take actions that promote sustainability.

So much to say, so little time...

An EarthTalk answer should be no longer than 500 words, so each and every one needs to count.

In Module 6 Students will create a concept map of key information they wish to include in their EarthTalk answer.

Concept Maps

There's no right or wrong way to create a concept map, it is simply meant help students visualize what information they have, what they think is most important for the reader to know, and how these key points relate to one another. Visualizing these connections now will help students organize and structure their answers later.

Student concept maps should include:

- Relevant background information readers need to know to understand the topic
- Main findings of research
 - How does this topic impact local systems (ecosystems, communities, economies, etc)
 - Common viewpoints or opinions
- Supporting facts, quotes, or graphics
- Proposed solutions and ways readers can help

To get started, students should write down their topic or research question on a sticky note or large paper. Then, using a sticky note for each new idea, fact, or quote, students will begin to layout their notes around the central topic. In this way students can connect related ideas, adding arrows or links between notes.

Module 6: Visualizing Your Answer Concept Map

Duration

Intro: 15 minutes
Activity: 40+ minutes
Wrap up: 5 minutes

Materials

- Pen or pencil
- Sticky notes
- Large paper, white board, etc.

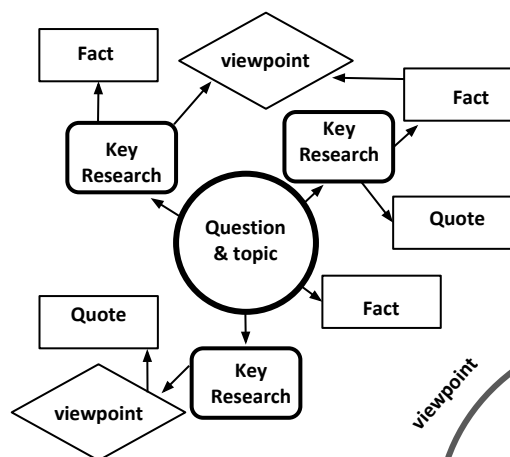
Adaptations:

- In lieu of student-generated questions and research, created in Parts One and Two of Earthtalk in the Classroom, teachers can guide students' focus by creating compelling research questions based on students' recent science curriculum. Instead of relevant quotes, students may use supporting facts from texts previously explored in class.

Things to consider:

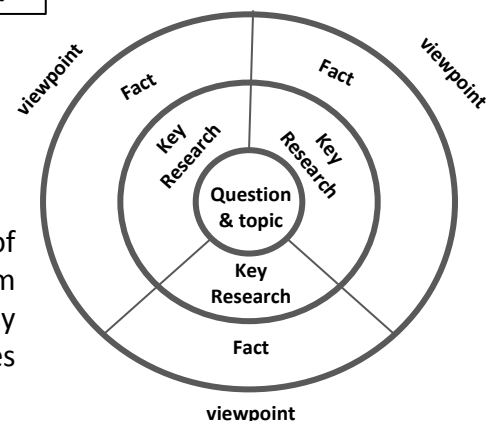
- Concept maps come in many forms, teachers should encourage student creativity and ingenuity.
 - Student interest in this stage may vary; some student will find this activity very helpful while others may not. Having students work in groups may help direct focus.
- or-
- Consider assigning this as a take-home activity. Later, have student groups come together to compare maps and create a cohesive vision.

Examples:



In this example, students' research is laid out like a flowchart. Arrows take the reader from key areas of research to different viewpoints, supported by facts and quotes.

In this example, key areas of research radiate out from the main topic, followed by facts and quotes



Laying the groundwork for you EarthTalk answer

After creating a concept map in the previous module, students will now organize their key information and structure their EarthTalk answer using an outline template.

The student worksheet provides students with a template for how an EarthTalk answer might look. Similar to the concept map created in Module 6, an outline may look different depending on the students' topic and research.

As always, please adapt this activity to meet the needs of your students.

Think of an EarthTalk answer as an abridged version of a traditional research paper or essay. Student answers should follow the format of a research paper and include an introduction, body, and conclusion.

Instead of introducing a thesis or problem statement, students will begin their EarthTalk answers by stating their Research Question.

The body of their answer will explore the various facets of their question — how their topic impacts local systems, various viewpoints on the issue, and potential solutions.

The conclusion will feature a succinct answer and a summary of what readers can do to effect positive change on this issue.

Module 7: Structuring Your Answer The EarthTalk Outline

Duration

Intro: 10 minutes
Activity: 45+ minutes
Wrap up: 5 minutes

Materials

- Student worksheet or journal
- Pen or pencil
- Computer (optional)

Adaptations:

- This activity may be assigned as an individual take-home activity. Student groups can then come together and compare outlines.
- If necessary, create a new template for students, that more closely aligns with their topic or challenge students to make their own.

Things to consider:

- If available, students may create their outline on a computer, this will allow them to easily rearrange or edit their outline and, later, transform into their final answer.

Backing up your claims with facts & quotes

Students should support their findings with appropriate facts, data, and quotes from their research. These should serve as supporting statements for students' own writing, providing emphasis or compelling voice.

Facts and quotes should be:

- **Concise** - students should select quotes that are short or are able to be condensed, while still accurately summarizing the quotes' original intent.
- **Easy to explain** - in two sentences or less, students must be able to easily explain the fact and demonstrate how it supports their answer.
- **Interesting** - students should select compelling facts and quotes that pique readers' curiosity.
- **Engaging** - facts and quotes should help readers relate to the issue, make it relevant to their own lives.

Topic:	Research Question:
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1. Introduction

Briefly introduce your topic and state your Research Question. Consider a “hook” to draw readers in. This could be an interesting fact, quote, or personal observation related to the issue.

Supporting facts & relevant quotes

2. What’s the issue? Background

Provide relevant background information to help readers understand why they should care.



Supporting facts & relevant quotes

3. What’s the issue? Local Impacts

What is the impact of this issue on local systems (ecosystems, communities, governments, economies, etc.)?

Supporting facts & relevant quotes

Module 7: Outlining Your Answer
Student Worksheet

4. What's being done?

What is making this issue better or worse? How are people responding to this issue.

Supporting facts & relevant quotes

5. What could be done?

What are some solutions to this issue that could be used locally? Are there pros and cons to these solutions? What can readers do?

Supporting facts & relevant quotes

6. Conclusion

What conclusion do you hope readers will take away from this? Use a sentence or two to clearly answer your Research Question.

Supporting facts & relevant quotes

Module 8: Writing Your Answer

Finding your Voice

In this final module students will create their EarthTalk answer.

These answer are meant to be brief (500 words or less), easy to understand, discuss the varied impacts and viewpoints of an environmental issue, and highlight solutions to this particular issue.

In the previous module, students generated outlines to their answers. Now all that's needed is to flesh these outlines out. In their final answers students will be able to finesse their writing, display their own voice, and connect with their intended audience.

Informal citations

Students support their answers with relevant facts, data, or quotes pulled from their research. In the final draft students must accurately cite all sources used, including quotations, facts or data, and summaries of others' work or ideas.

In text citations

Students must briefly introduce all sources cited in their text. An introduction may include:

- The author and/or organization
- Their connection to the issue (journalist, resident, business owner, etc)
- Type of source (article, interview, etc.)

Example: "in an interview with the Seattle Times, Mayor Jenny Durkan said...."

Post-text citations

Following their answer, students should make a list of all sources cited, titled "Contacts." If students are familiar with a particular citation format, use that. However, a simple citation containing article title, author, and where they found it (url, book title, etc) is sufficient. If students are using computers, they may include a link to their source.

Duration

Intro: 10 minutes
Activity: 60+ minutes
Wrap up: 10 minutes

Materials

- Student worksheet or journal
- Pen or pencil
- Computer (optional)

Things to consider:

- Depending on how familiar students are with writing short essays, they may require more time for this module. Consider taking two class periods for this activity or assigning students to finish this activity at home.
- If students are working in groups to create their answers, task them to delegate work among group members appropriately
- If time allows, consider having students peer edit one another's answers. Another set of eyes might help students refine their answers- trimming away excess words, identify areas that need to be discussed more, and settle any remaining questions.

Taking EarthTalk beyond your classroom

The EarthTalk Q&A format was created to promote environmental literacy worldwide. Focusing on solutions to pressing environmental problems, EarthTalk answers are meant to inspire readers to act locally within their communities to effect positive changes globally.

These answers are meant to be shared. Post them at your school, distribute it in the next parent newsletter, or consider sharing them with local newspapers and online blogs.

EarthTalk in the Classroom

It's time to write your final draft of your EarthTalk answer.

You already have all the information you need, now is the time to finally put it all together! This worksheet provides you with a checklist of things your EarthTalk answer should include as well as a few useful tips and things to consider while writing.

Who is your audience?

Our goal with these responses is to spark interests of people who may or may not have much knowledge in this subject. Therefore, your answer should be informative and easy to understand. Your response should also be interesting, engaging, and go beyond what someone can find in a quick online search.

Objective vs. subjective...

To be objective is to remove feelings and opinions from your work and to solely on facts. Subjective is the opposite— relying on one's feelings, tastes, and opinions.

...or somewhere in the middle

These EarthTalk answers aim to provide accurate information to our readers. Your answer must be based on proven and reliable facts.

Being objective, however, is sometimes easier said than done, this topic may be personal for you and your community. Remember, *you* asked the questions and *you* did the research. You may not be an expert here, but your lived experiences and observations matter.

Be thorough; make sure to discuss other viewpoints and opinions, try to see this issue from other perspectives. But make sure to include your own voice too, especially when weighing potential solutions. How will these solutions impact your community? Are they effective? Practical? What unintended impacts might they al

✓ EarthTalk Checklist

- Research question is clearly stated in the introduction paragraph
- Necessary background information has been provided for readers to understand the issue
- At least two different ways this issue impacts local systems are explained
- Common viewpoints or opinions about this issue are discussed
- Solutions or ways to effect positive change are introduced
- Sources used are evaluated and determined to be credible and accurate
- All sources are cited correctly within the text
- Sources are compiled into a list titled "Contacts" after the answer
- Answer is readable and succinct, no more than 500 words

3rd, 2nd, 1st, go!

- Use third person (he, she, they) wherever possible. Use proper titles and organization names. **Example:** "The United Nations Attorney General declared..."
- Consider using the second person (you) when discussing solutions or impacts. **Example:** "Call your elected officials today" or "Next time you're at the grocery store..."
- Try to avoid using first person (I, me) except to discuss personal observations.