EARTHTALK
Questions & Answers About Our Environment

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. These modules are meant to serve as supplemental resources to middle school environmental and social sciences curriculum.

Part Two: Research and Evaluating Sources

Part Two of Earthtalk in the Classroom is divided into three modules. **Module 3: Preliminary Research** helps students create a simple outline to direct and focus their research. **Module 4: Finding and Evaluating Sources** guides student research and provides background on finding credible sources. **Module 5: Research** allows students to dig deeper into their sources to find information related to the their driving research question.

(If you're using the EarthTalk in the Classroom modules sequentially, students will have already created their research questions in Modules 1 & 2. However, like all EarthTalk in the Classroom modules, Part Two can be used independently to support other science curricula.)

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.6-8.7 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.6-8.8 Gather relevant information from multiple print and digital sources, using search terms effectively; assess the credibility and accuracy of each source; and quote or paraphrase the data and conclusions of others while avoiding plagiarism and following a standard format for citation.

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

Next Generation Science Standards

Part Two 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.
  - 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.
- **Obtaining, Evaluating, and Communicating Information**
  - Critically read scientific texts adapted for classroom use to determine the central ideas and/or obtain scientific and/or technical information to describe patterns in and/or evidence about the natural and designed world(s).
  - Gather, read, synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence.

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.

Module 3: Preliminary Research

Research is the backbone of the EarthTalk in the Classroom Process.

This short module helps set students up for success by helping them generate keywords and phrases to direct and focus their research.

Meeting students where they're at

The three modules that make up Part Two of EarthTalk in the Classroom may require adjustments or adaptations to meet the needs of your students, depending on their proficiency conducting research.

From novice to expert, Module 3 is an important step in the process. Preliminary research concentrates student focus and reinforces the bigger picture behind their research question.

F**or students new to the research process**, teachers may choose to provide students with an array of sources relevant to their research topic. From this collection, students can conduct research and find the information to answer their question.

For students with experience conducting research, teachers may provide a few suggestions on where to look, but should encourage students to be in charge of their own research.

For an added challenge, encourage students to find less conventional resources- interview an expert or someone affected by their research topic, attend a community event, or explore an art piece related to their topic.

Duration
Intro: 5 minutes
Activity: 25+ minutes

Materials
- Student activity sheet or notebook
- Pen or pencil
- Computer with internet (optional)

Adaptations:
The following modules rely on research topics and questions designed by students in Part One of EarthTalk in the Classroom. In lieu of student-generated research questions, teachers can guide students' focus by creating compelling research questions based on students' recent science curriculum or current events making an impact in students' communities.

Analogue resources:
These days, we often look to the internet for information. However, don't forget the many analog resources available to you such as newspapers, magazines, books, people, events, and even artwork. Don't forget your local library too!

Trusting your online sources:
Your school may already have online portals for student research. Below are a few trusted search engines adapted for student use:

- **KidTopia** is a Google custom search engine designed for primary school students, which only lists websites trusted by educators. **www.kidtopia.info**
- **InfoTrek**, another custom search engine, is designed for secondary school students. **www.infortrek.info**
- **News ELA** is a great source for trusted news, available at different reading levels. **www.newsela.com** *Note: Teachers must create an account to access.* Consider finding a few articles to share with students related to their research topic.
- **Sweet Search** is a search engine create for students, offering both news and informational articles on a variety of topics. **www.sweetsearch.com**
- **Google Scholar** hosts scholarly articles and texts from around the world. **www.scholar.google.com** *Note: some sources may require students to login or subscribe to access full texts.*

Module 3: Preliminary Research
Student worksheet

Name(s): _____ **Date:** _____

Research Topic: _____
_____
_____

Research Question: _____
_____
_____
_____

Three keywords or phrases related to your topic:

1. _____
_____

2. _____
_____

3. _____
_____

Two places I plan to start my research are:

1. _____
_____

2. _____
_____

Two sources I plan on using are:

1. _____
_____

2. _____
_____

Preliminary Research…
Pre-research... Presearch?

Whatever you want to call it, take this time to make a strategy for your research: How and where will you look for sources? What types of sources will you use?

If you were to type your entire research question directly into an online search engine, like Google, you might not receive useful results.

Instead, take some time to brainstorm a few keywords or short phrases related to your topic. These keywords will help you search for and gather information needed to better understand your topic and answer your research question.

To Google or not to Google...

Search engines like Google are a great place to find fast information or to start your search. Many search engines, however, don't evaluate the accuracy or trustworthiness of the websites that show up. They simply bring up the most visited sites related to your search.

To get relevant and reliable information- consider using a database provided by a university or institution. These types of databases gather information from trusted sources like journals and encyclopedias and will often provided citation information.

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To Google or not to Google...

Search engines like Google are a great place to find fast information or to start your search. Many search engines, however, don't evaluate the accuracy or trustworthiness of the websites that show up. They simply bring up the most visited sites related to your search.

To get relevant and reliable information- consider using a database provided by a university or institution. These types of databases gather information from trusted sources like journals and encyclopedias and will often provided citation information.

Name(s): _Emma & Tessa_   **Date:** _3/13/20_

Research Topic: _Wildlife in the City_

Research Question: _How do wildlife in the city, like squirrels, survive?_

Three keywords or phrases related to your topic:

1. _Wildlife in the City_

2. _Urban Squirrels_

3. _Urban wildlife survival_

Two places I plan to start my research are:

1. _Info Trek   www.infotrek.info_

2. _Google Scholar   www.scholar.google.com_

Two sources I plan on using are:

1. _Wild Cities by National Geographic_
   https://www.nationalgeographic.com/animals/wild-cities/

2. _Urban Squirrels by Portland Audubon_
   https://audubonportland.org/our-work/rehabilitate-wildlife/having-a-wildlife-problem/urban-squirrels/

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Module 4: Evaluating Sources
Get S.M.A.R.T.

Duration
Intro: 10 minutes
Activity: 30+minutes
Wrap up: 5 minutes

Materials
- Student worksheet or journal
- Printed copy of their sources
  -or-
- Computers & internet connection

Things to consider:
- Practice evaluating a few sources together, as an entire class, to familiarize students with the process.
- Encourage the use of sources previously used in class.

There's a lot of information on the internet these days. Sharing information online allows us to learn and communicate with other humans around the world. Anyone can create anything — a writing, drawing, video, recipe, you name it — and instantly send it out for others to read, use, and share.

To answer to our research question, however, we want to make sure that our sources are accurate, relevant, objective, and unbiased.

What do we mean?

Accurate - Facts and numbers are correct and are easy to understand.

Relevant - Up to date and related to the topic of your research question.

Objective and Unbiased - the accuracy of the source is not influenced by the author's or publisher's personal opinions or feelings. Biased articles may have accurate facts, but may present them in a way that supports one viewpoint over another. Make sure to get all sides of the story, find additional sources.

For more resources to help your students evaluate sources, check out the **Digital Literacy Assessment** by the Stanford History Education Group.

In this module students will use the **S.M.A.R.T. Test** to evaluate three of their sources.

Source: Who's the source?

Is the source well known? Are they reliable? Large news outlets, journals, universities often have teams of writers and fact checkers, smaller sites or personal blogs and websites may not.

Motive: Why did they write this?

Does the author/source have a particular point of view that may influence how/what they write?

Check your news articles using the Media Bias Database.

Authority: Put the Author back in Authority.

Who wrote the story? Is the author an expert? Often online news sources will have short bios of their reporters. Have they written about this issue before? Where else have they worked or studied?

Review: Read the article carefully.

Does it make sense? Is it consistent? Try rereading the article as someone with an opposing viewpoint. Is it fair? Is there more to the story? Make a list of questions or observations after reading.

Two source test: Double check everything.

Are there other sources on this subject? If so, do they agree or contradict the first source?

The S.M.A.R.T. Test was created by the Constitutional Rights Foundation

Module 4: Evaluating Sources
Student Worksheet

We are living in a world where information is easier to create and share than ever before.

Through the internet, we can communicate our thoughts and ideas as fast as we can create them.

But we must wade through this ocean of information to find the answer to your research question. Our priority is to provide true information and facts to our audience. To do so, we need to evaluate our sources.

Accurate - Facts and numbers are correct and are easy to understand.

Relevant - Up to date and related to the topic of your research question.

Objective - the accuracy of the source is not influenced by the author's or publisher's personal opinions or feelings.

Use the S.M.A.R.T. Test on your sources

Source: Who's the source?
Where did you find this source? List the author and website that provided this article.

Motive: Why did they write this?
Examine the article for bias. Does the author/source have a particular point of view that may influence how/what they write?

Authority: Who wrote this story?
Put the author back in authority. Who is the author and do they know about this subject?

Review: Does it make sense?
Read the article carefully. Are the facts presented accurate?

Two sources: can you find more info?
Are there other sources on this subject? If so, do they agree or contradict the first source?

Trust your information

There's a lot of stuff out there on the internet. Look for trustworthy articles and information. Not all sources fact check their information or objectively present information. There are plenty of resources out there to help make sure your sources are trustworthy.
Here's a few things to look for when assessing the trustworthiness of a source:

- **No author -** Not all websites list authors, especially larger organizations or governments. Check the "about us" to learn more about the organization.

- **Provocation -** Does the story stir up strong emotions? If an article makes you extremely angry, it might have been written intentionally do so. This is bias, look for other sources to support or disprove.

- **Satire** - using humor and jokes to criticize a current event or topic. Websites like theonion.com

- **Unusual domains** - unusual or misspelled domains URLs may be fake or intentionally misleading. (example: website.com.co, nytines.com, memenews4u.to)

- **Personal website or blog**, check the domain for .wordpress or blogger, which host other peoples' blogs.

Module 4: Evaluating Sources
Student Worksheet

Source:
Title:
Author:

Date published:
Publisher:

Motive: What is the purpose of this website? (circle one)
- **Company or organization website**
- **Personal website**
- **News**
- **Educational or research website**
- **Entertainment**
- **Advertisement or online shopping**
- **Social media**
- **other**

URL: What clues does the website URL tell you about the source? (circle one)

.gov	US Government website
.edu	University
.com	Company
.org	Non-profit
.ca, .mx, etc.	Country code, usually an abbreviation of country's name

Authority: Can you Identify the author? How do they know about this subject?

Review: Rate the article or website for each of the following questions:

A. Is the information relevant to my topic and research question?

  NO   1   2   3   4   5   6   7   8   9   10   YES

B. Is this information up-to-date?

  NO   1   2   3   4   5   6   7   8   9   10   YES

C. Is the information objective and unbiased?

  NO   1   2   3   4   5   6   7   8   9   10   YES

D. Did the information make sense?

  NO   1   2   3   4   5   6   7   8   9   10   YES

Two-Source Test: circle one
- **Can you find another source reporting on this topic?   YES/NO**
- **Do these sources agree or contradict each other?   YES/NO**

Briefly summarize the article or information presented on this website

Was this source useful for your research?   YES/NO

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Annotating your sources

After finding and evaluating their sources in the previous modules, students will now be challenged to take an even closer look at their sources in Module 5.

Students will hone their research skills by digging a little deeper into their sources to find key facts, interesting quotes, and other relevant information to help them answer their research question.
During this activity, students will review their sources again, taking note of significant information.

Encourage students to fill out as many squares as possible. Once they get three in a row or "bingo," challenge students to try to fill the whole sheet.

Duration
Intro: 10 minutes
Activity: 40+minutes
Wrap up: 10 minutes

Materials
- Student worksheet or journal
- pen/pencil, highlighter, sticky notes
- Printed copy of their sources

Things to consider:
- To develop student research skills, allow students to work together on this module.
- For students already familiar with the research process, this module can be assigned as an individual or take-home project. Students can then regroup and compare notes.
- Encourage students to personalize their research process: use a color-coding system, use sticky notes, or draw a concept map of their sources.
- Create your own bingo sheet, related to student topics.

But what makes information significant?
There's no one right way to annotate sources; different sets of eyes will see different things in the same article.

Significant information may include:

- Key facts or concepts related to research topic
- Important numerical figures or statistics
- Major viewpoints or opinions
- Impacts of issue on local communities
- Interesting quotes
- Personal impressions of source
- Ways students or local communities can have a positive impact on the issue
- Unanswered questions students may still have
- Areas of further research

Module 5: Research
Annotation Bingo

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Fill out as many squares as possible, using examples from your research notes. More than one example can be used in each square. Use additional pages, if needed.

Something you already knew about this topic at the start of this project:	Something new or surprising you learned about your topic:	Relevant facts or statistic about your topic:
How this topic or issue impacts local communities:	Draw a cartoon related to you topic:	One way people have an impact on this topic or issue:
Opinion or viewpoint of a source or mentioned by a source:	Interesting quotes:	Local ways we can positively impact this issue:

FIll out as many squares as possible, using examples from your research notes. More than one example can be used in each square. Use additional pages, if needed.

Something you already knew about this topic at the start of this project:	**Something new or surprising you learned about your topic:**	**Relevant facts or numerical data about your topic:**
How this topic or issue impacts local communities:	**Draw a cartoon related to you topic:**	**One way people have an impact on this topic or issue:**
Opinion or viewpoint of a source or mentioned by a source:	**Interesting quotes:**	**Local ways we can positively impact this issue:**