Yale SCHOOL OF MEDICINE

*As of May 2022*

# Teacher Guide 2: Know Your Sources

Module 2 contains three different challenges, each which contains a number of stand-alone activities that can be done in any order based on the interests and needs in individual classrooms.

***NGSS in this module:***

**Science and Engineering Practices:**

**Obtaining, Evaluating, and Communicating Information**

- Compare, read, and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.
- Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.
- Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible.

**Disciplinary Core Ideas:** **N/A**

**Crosscutting Concepts:** **N/A**

**Key Terms:**

- Primary source
- Secondary source
- Scholarly source
- Popular source
- Lateral reading

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## Module 2: Know Your Sources

The Story: After hearing about the COVID-19 pandemic, and specifically about an outbreak of it in their New Haven community, Tash, Ray, and June begin to search for more information, worried about the symptoms Tash is displaying. However, they find many websites and news pages that offer conflicting information. Every website the three visit seems to present new information, which is often blatantly false, and almost nothing is consistent between articles. What types of web pages and news articles can be trusted, and how can you tell?

**Performance Expectations:**

After completing Module 2, students will be able to:

- Differentiate between different types sources (primary vs secondary, popular vs scholarly)
- Deploy strategies to effectively navigate the online information environment
- Critically evaluate information encountered online in a variety of contexts

**Challenges**

1. **How do I navigate the overwhelming amount of information I encounter online?**
2. **How can I evaluate information online?**
3. **How is scientific knowledge disseminated?**

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## Challenge 1: How do I navigate the overwhelming amount of information I encounter online?

**Learning Targets:**

- I can explain the difference between a popular and a scholarly source.
- I can determine if information I'm reading is a primary or secondary source.
- I can use strategies like lateral reading to bring more variety and fact-checking into my information consumption habits.

**Estimated Time:** 30 minutes

**Activity 1: Consider Your Sources**

- **Watch:**
  - Segment from Check Yourself with Lateral Reading: Crash Course in Navigating Digital Information series [1:10-12:50]
- **Read:**
  - Table comparing popular and scholarly sources [https://guides.lib.berkeley.edu/c.php?g=83917&p=3747680]
  - Comparison of primary and secondary sources in science [https://library.albany.edu/infolit/resource/prisci]
- **Reflect & Discuss:**
  - Looking at your web browser history or just thinking about the past week, make a list of five websites you recently got information from. Are they popular or scholarly sources? Are they primary or secondary sources? Based on the video and readings, reflect on and discuss strengths and weaknesses of your current information consumption habits.
- **Create:**
  - Complete the table below by thinking about websites or applications you currently get your information from and brainstorming two potential alternative places you could look at to confirm or contextualize that information.

| **Websites or applications I currently get my information from:** | **Potential lateral reading options** |
|---|---|
| | |
| | |
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| | |
| | |

- **Share:**
    - Swap completed tables with a partner and discuss.

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## Challenge 2: How can I evaluate information I encounter online?

**Learning Targets:**

- I understand ways to evaluate information online
- I can recognize credible sources of information
- I understand how to verify information accuracy

**Estimated Time:** 20-30 minutes

**Activity: What is Credible?**

- **Watch [3:25]:** Sifting through the Outbreak, by Caulfield, Washington State University Vancouver

**Watch [3:14]**: Evaluating Sources for Credibility, by NC State University Libraries

- **Read:** How to Evaluate COVID-19 News without Freaking Out (Scientific American)
- **Read:** COVID-19: Evaluating Information on COVID-19 (University Libraries, University of Washington) [https://guides.lib.uw.edu/research/covid19/evaluating]

[Optional: "Misinformation During the Covid-19 Pandemic" https://blogs.vcu.edu/librarystories/2020/03/27/misinformation-during-the-covid-19-pandemic-tips-for-evaluating-health-information-and-sources-for-finding-reliable-health-information/ ]

- **Reflect & Discuss:**

With a partner, consider the 3 resources below:

Resource #1:
https://twitter.com/CDCgov/status/1298668074342768640
Resource #2:
https://web.archive.org/web/20200212032655/https://twitter.com/livecrisisnews/status/1227385539629867008
Resource #3:
https://www.theatlantic.com/ideas/archive/2020/07/scourge-hygiene-theater/614599/

As a team, respond to these questions:

1. Where is each resource published online?

2. If you can find a publication date, what is it?
3. Is the author or contributor a person or an organization? Name the author and/or the organization.
4. Has the author or contributor written about COVID-19 previously? What other topics have they written about?
5. Do any of the resources include evidence? If so, what is the evidence, and can you access it?

•**Share:** As a team, be prepared to share with your class the following questions & answers:

1. Evaluating information is important because...
2. Evaluating information about COVID-19 is important because...
3. Two ways that anyone can evaluate information about COVID-19 include...

## Challenge 3: How is scientific knowledge disseminated?

### Learning Targets:

- I can explain why the scientific publication process takes time
- I understand the difference between peer reviewed journals and non-scholarly sources
- I can identify preprint articles and explain their role in the pandemic information landscape

**Estimated Time:** 25 minutes

**Activity 1: Understanding Different Sources**

- **Watch:**
  - Overview of scientific publishing process and introduction to preprints [4 minutes] [https://www.youtube.com/watch?v=2zMgY8Dx9co&ab_channel=iBiology ]
  - What happens once a manuscript has been written at Nature [3 minutes] [https://www.youtube.com/watch?v=ClfwnVh8z6s&ab_channel=naturevideo]
- **Read:**
  - One researcher's journey through the publishing process [https://www.nature.com/news/does-it-take-too-long-to-publish-research-1.1932 ]
  - Preprints and the coronavirus [https://www.nature.com/articles/d41586-020-01394-6 ]
- **Reflect & Discuss:**

  Step 1:
  Read the following article from healthline.com:
  "Trump Is Taking Hydroxychloroquine: Why Experts Say You Shouldn't"[https://www.healthline.com/health-news/trump-is-taking-hydroxychloroquine-why-experts-think-this-is-a-bad-idea ]

  Step 2: With a partner, create a list of the people, organizations, and other sources referenced in the article. After you have created the list, circle the reputable sources.

Step 3: With a partner, answer the following questions:

1. Is the article you read from healthline.com peer reviewed?
2. When was the article published?
3. How long do you think it took the author to write and publish this article?
4. From the list of sources you created, which of the reputable sources would be considered “peer reviewed” journals?

Step 4: With a partner, pretend you are talking with your friends and family. In 2-3 sentences, explain to them why peer review is important and how they can identify peer reviewed material to fact check information about COVID-19.

## Professional Opportunities:

Librarian
https://www.bls.gov/ooh/education-training-and-library/librarians.htm

Information Scientist
https://www.zippia.com/information-scientist-jobs/

Journalist
https://www.wix.com/wordsmatter/blog/2020/04/how-to-become-a-journalist