

Communication Curriculum

Lesson 5

Understanding Science Writing

Lesson Overview:

Students will continue the Communication Curriculum by completing the following steps: 1) screening the Understanding Science Writing video and discussing the value and skills necessary for understanding technical science writing 2) reading a non-technical article with scientific skepticism and assessing the reliability of the information 3) reading a technical scientific paper using helpful tips for comprehension. An extension exercise invites students to read an article written for the public about the same research presented in the scientific paper and comparing and contrasting the two articles.

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Communication

Lesson 5 – Understanding Science Writing

Lesson Overview

During this lesson, you will guide students to consider the value and skills of understanding scientific writing. Students will review a non-technical article and review for reliability. Then they will practice reading a technical research article by following helpful steps that point them to the main points they will need for comprehension. An extension exercise invites students to compare a non-technical article with the technical paper about the same research.

Time Frame:

~1½ hours, including time for students to complete independent work
20-30 minutes for an optional extension activity

Core Concepts:

- The science presented in mainstream media should be consumed with a healthy dose of scientific skepticism, as it may purposely or inadvertently be misleading
- The ability to understand scientific writing can help you to understand the scientific research and results
- Reading scientific writing can provide context for your own scientific exploration

Lesson Objectives:

In this lesson students will:

- Familiarize themselves with technical science writing
- Deconstruct scientific writing for greater understanding
- Use critical thinking to compare and critique science articles

Materials Needed:

- [Lesson 5 Video: Understanding Science Writing](#)
- Understanding Science Writing Worksheet
- One or more mass media science articles (suggested links in lesson plan)
- Scientific article (suggested links in lesson plan)
- Corresponding mass media science article (optional – suggested links in lesson plan)

Step 1: Introduce the Lesson

Explain to students that in this lesson they will become familiar with technical science writing (if they are not already). They will also become more comfortable with reading and understanding this kind of writing that is most often found in journal articles and research reports.

Step 2: Activate Prior Knowledge

(5-10 minutes)

Ask students where they have learned about scientific research and discoveries. Accept all answers. If students do not mention news outlets such as news websites/blogs, television news, the radio, etc. ask if they have also learned about scientific discoveries from these sources. Allow for a brief discussion.

Step 3: Present the Understanding Science Writing video

(15 minutes)

Facilitate a discussion after viewing the video. You may wish to solicit questions and comments from the students first. You can use these suggested discussion points to deepen the conversation and student thinking:

- What are the benefits and drawbacks of getting all of our scientific information from news outlets such as blogs, magazines, and podcasts?
- Why can it be useful to learn about scientific research and discoveries from technical sources written by researchers?
- Have you ever tried to read a technical research article? What was difficult about it?

Step 4: Explore the problem with relying on non-technical information sources

(20-30 minutes)

Depending on previous discussions in the lesson, reiterate or introduce this idea: *While news articles and blog posts can be easily found and digested, the information is not always reliable.*

Ask *Have you ever read something new and wondered what the evidence really looked like?*

Explain that they will have the opportunity to assess an article and that they should read it

with a skeptical eye. Offer one or more of the following articles for students to read:

- [New Study Says Chocolate Can Cure Coughs](#)
- [Cell-Phone Distracted Parenting Can Have Long-Term Consequences: Study](#)
- [Bacon, Processed Meats as Dangerous as Smoking](#)
- [How nail polish makes you fat](#)

After students finish reading, ask them to form pairs and discuss the article. Encourage pairs to discuss questions or concerns that they have about the science “facts” in the article. What are they skeptical about? How could they find out more?

Follow up with a brief class discussion and invite a few pairs to share their discussion.

Step 5: Review Steps for Understanding Scientific Writing

(15 minutes)

Refer back to the video and remind students that technical scientific writing can be a good way to check the accuracy and reliability of scientific news. None the less, understanding science writing can take some practice. They may find it useful to first skim an article for an overview, and then to read it a second time with specific questions/steps in mind.

Explain that they will have an opportunity to practice by reading a scientific article. Distribute the Understanding Scientific Writing worksheet.

Review the steps for understanding scientific writing by going over the worksheet and sharing the information below. Alternatively, you may wish to show this section of the video again.

1: Central question or thesis of the article

All scientific or technical writing describes a question that the researchers attempt to answer. The question may be clear from the abstract (the technical summary at the beginning of the article). Alternatively, you may find the central question or thesis in the “Introduction” in a research article.

2: Prevailing Theories

Prevailing theories serve as the background to the current research. You should determine whether the article seeks to support or refute these theories. Background and prevailing

theories can often be found in the “Introduction,” or you may also find references to previous research in the “Discussion” as it pertains to the researchers’ specific conclusions.

3: Strategies and Methods Used

In this case “Strategies and Methods” refers to the steps used to investigate the central question or thesis of the article. Look for information on the experimental design and whether the research strategy is based on previous work. Most technical articles will include an entire “Methods” or “Procedure” section.

4: Conclusion of the article or study

Article authors will typically include a “Conclusions” or “Discussion” section near the end of the paper. The conclusion should point out whether predictions based on the central question were supported by the results. As a reader, it is important to compare the “Results” section with the final conclusions. Do they match? Are the results strong enough or complete enough to reach the stated conclusion? It may make the most sense to read the conclusions first and then reference the “Results” section to check for their validity.

5: Implications

Why do the results and conclusions matter? What are the recommendations and/or implications for future research? The “Discussion” or “Conclusion” sections of the article are most likely to include the implications of the research, although you may also find hints at the implications and context for the wider public in the “Introduction,” as well.

Step 6: Practice reading scientific writing

(30 minutes)

Distribute a scientific article for students to read. Select one of the links below or choose an article that relates to student interest or course content.

[Cardiovascular effects of flavanol-rich chocolate in patients with heart failure](#)

[Gang Membership, Violence, and Psychiatric Morbidity](#)

[Sleep Habits and Susceptibility to the Common Cold](#)

Ask students to skim the articles, then use the worksheet to better understand the content.

After students have worked on their own for a while, ask them to work in pairs. With their partners they should check to see if they have both come up with the same understanding. Ask them to discuss any differences of understanding. Have them work together to

continue filling in the worksheet.

As the pairs finish up, ask for a few volunteers to share their understanding of the article or to share the parts that they still do not understand. Discuss the article as a group. After coming to a group understanding of the content, ask the class to reflect on the experience. Guide the discussion with the following questions.

- How was reading scientific writing different from consuming science produced for the public?
- Did the worksheet help? Why or why not?
- What was the hardest part?
- What was the value of reading the scientific article?

EXTENSION: Comparing and Contrasting Scientific Writing to Science News for the Public

(15-20 minutes)

Explain to the students that they will now read an article that was written for the public about the same scientific research. Articles that correspond to Step 6 articles are linked here:

[Why Your Doctor Eats Chocolate](#)

[Gang Violence Linked to High Levels of Mental Disorders](#)

[Sleepless nights equal more colds in U.S. study](#)

Distribute the corresponding articles for students to read. Distribute second copies of the worksheet for students to complete as they read.

After students have completed the exercise, ask students to consider the first and second articles. Compare and contrast the articles in a class discussion. Use the following questions:

- Who is the audience for each article?
- What data or evidence is presented to support the main claim of piece, and how is it presented?

- How are the implications of each research finding presented? How are they similar or different?
- What are the counterarguments, or the arguments against the conclusions of the piece, and how are they presented?
- Which piece do you find more persuasive? Why?
- What are the benefits and drawbacks of each type of writing?