

Evaluating Sources, Models, and Evidence in Research Articles - *Teachers*

Background:

We want students to use lateral reading and the reasoning processes supported by the MEL scaffold in their lives outside the classroom. This flexible transfer task was developed to determine how well students transfer these skills to new situations, such as evaluating sources and claims of articles about science topics.

Students may complete the transfer task in small groups or independently; adjust the steps for implementation below as needed based on your choice. If this is being used as a summative assessment, consider having students work individually.

Steps for Implementation:

1. With students working on laptops or tablets, provide links to **two** articles on the topic you selected. Students should complete Step One: Evaluating Sources on the graphic organizer.
2. The last question on the graphic organizer asks students which article they think is **more credible** on the topic. Students should complete Steps 3-5 below using **only** the article they believe is **more credible**.

Option: At this point, consider taking the time to discuss the credibility judgments students made about each article. Here are a few suggested questions to facilitate that discussion:

- 1) How credible did you decide the first source was and why? What about the second source?
- 2) Which article do you think is the more credible source of information about this topic? Why?

3. Students read the article they select either by themselves or in small groups using “low-voice” read-aloud technique. Students are encouraged to mark up the article to highlight important points.

4. Students complete the table and answer Questions 1-3.

5. Students meet in groups to discuss the article and contents of their tables.

- How did the evaluation classification (Question 1) vary among your group members?
- What were the key lines of evidence presented?
- How well did each line of evidence support the research individually and when coupled with the other lines of evidence?

6. Whole Class Discussion

- Review students’ answers to questions, followed with questions such as these:
 - How did your discussion with your group help you learn more about the sources of both articles? Did it change your opinion about the credibility of either article?
 - Why did we only ask you to read and analyze the more credible article?
 - How did your discussion with your group help your understanding of the content of the article?
 - Did you identify additional lines of evidence after your group discussions?
 - Were there any alternative models presented in this article? If so, how did you rate them? Why?

Teacher Reflection:

Review student work and consider the following questions when assessing their responses.

- How did your students approach evaluating both online articles? Did they show evidence of effectively reading laterally?
- Did most students choose to read the more credible article? How might you further support students who picked the other article?
- What additional support do your students need to improve their skill and efficiency at lateral reading?
- How do your students evaluate models and evidence when presented with evidence? In what ways might you modify this activity to help students think more critically about models and evidence?
- What did students do differently when evaluating articles compared to the MEL task? What similarities?
- What are some of the challenges for students in evaluating evidence?
- How do students consider alternative models in relationship to the model at the focus of the article?

Step One: Evaluating Sources

For this part of the activity, you will evaluate two online articles that your teacher provides. Answer the questions below as you evaluate the sources.

Article 1: [teacher fill in with link]

Article 2: [teacher fill in with link]

1. How credible is Article 1 as a source of information about [teacher fill in]? Make sure you explain why.
2. How credible is Article 2 as a source of information about [teacher fill in]? Make sure you explain why.
3. Which article- Article 1 or Article 2- is **more credible** as a source about [teacher fill in]? Explain why.

Step Two: Evaluating Models and Evaluating Evidence

For this part of the activity, you will first identify the claim or explanatory model presented in a science news article. Then, identify evidence statements that are used to support the model. The number of evidence statements may vary depending on the article you read.

Article Title:	
Claim or Model Presented:	
Evidence #1:	
How does the evidence support the model?	
Evidence #2:	
How does the evidence support the model?	
Evidence #3:	
How does the evidence support the model?	
Is an alternative model presented? If so, what is it? Also provide the evidence supporting it.	

Questions:

1. How would you rate the plausibility of the claim or model presented in the article based on the evidence you gathered? Use a scale of 1 (low plausibility) and 10 (highly plausible) and explain why you rated the claim or model as such. If there is an alternative claim or model, also rate the plausibility of the alternative on a scale from 1 to 10.

2. What evidence did you use to rate the plausibility of this model/claim?

3. What questions would you ask the author or scientist about the claim/model and/or lines of evidence?

BUNDLED ITEMS:

Articles: some from SN Explores; others from other sites; ideally from sources that students are unfamiliar with (ex: not NYTimes, NatGeo, etc)

Bundle #1 - Measles Cases and Vaccinations

(More credible) <https://medicalxpress.com/news/2024-04-global-measles-cases-year.html>

(Less credible) <https://www.nvic.org/newsletter/feb-2024/measles-truth-consequences>

Bundle #2 - GMOs in Food

(More credible)

<https://www.nationalacademies.org/based-on-science/foods-made-with-gmos-do-not-pose-special-health-risks>

(Less credible)

<https://www.corteva.com/resources/blog/plate-wise/are-gmo-foods-safe-article.html>

Bundle #3 - Regenerative Agriculture

(Less credible)

<https://www.syngentagroup.com/regenerative-agriculture>

(More credible)

<https://www.weforum.org/agenda/2022/10/what-is-regenerative-agriculture/>

Bundle #4 - Nuclear Energy

(more credible)

<https://www.weforum.org/agenda/2024/01/nuclear-energy-transition-climate-change/>

(less credible)

<https://www.orano.group/en/unpacking-nuclear/7-good-reasons-for-turning-to-nuclear-power-to-combat-global-warming>

MEL-only Transfer Task Articles

Here is a list of suggested articles for this task; however, the topics do not necessarily mirror the content of the MELs and baMELs. The criteria used to select these articles included readability level, the research behind the investigations and some of its findings (as opposed to an encyclopedic entry), and the articles being contemporary/engaging. Consider these criteria when seeking your own articles to use for this task. Readabilities were checked with <https://www.webfx.com/tools/read-able/>

Title: An ancient cold snap causes heated debate: The claim that a comet was responsible just won't die

Date: August 9, 2018

Article focus: Astronomy

Link: <https://www.snexplores.org/article/ancient-cold-snap-causes-heated-debate>

Readability: Grade 8

Title: Antarctica's melting speeds up: The continent has lost about 3 trillion metric tons of ice since 1992, raising global sea levels

Date: July 18, 2018

Article focus: Weather and Climate

Link: <https://www.snexplores.org/article/antarcticas-melting-speeds>

Readability: Grade 7

Title: Is Zealandia a continent? Landmass lies mostly beneath the Pacific Ocean

Date: March 13, 2017

Article focus: Geology

Link: <https://www.snexplores.org/article/zealandia-continent>

Readability: Grade 8

Title: What killed the dinosaurs? New rocky evidence has been emerging about the dinos' final days

Date: January 30, 2017

Article focus: Fossils with Animals, Earth Science

Link: <https://www.snexplores.org/article/dinosaurs-extinction-asteroid-eruptions-doom>

Readability: Grade 9

Title: Oxygen-rich air emerged super early, new data show: If correct, it occurred before the evolution of animal life

Date: August 21, 2016

Article focus: Earth Science with Chemistry, Evolution

Link: <https://www.snexplores.org/article/oxygen-rich-air-emerged-super-early-new-data-show>

Readability: Grade 7

Title: Western U.S. on the rise: Ongoing drought-induced uplift in the western United States

Date: September 26, 2014 (AAAS Science article date)

Article focus: Water use

Link: <https://www.scienceintheclassroom.org/research-papers/western-us-rise>

Readability: Grade 8

Title: Distant galaxy seems filled with dark matter

Date: September 21, 2018

Article focus: Astronomy, physics, deep space

Link: <https://www.snexplores.org/article/distant-galaxy-seems-filled-dark-matter>

Readability: Grade 8

Title: New tools aim to better predict blooms of toxic algae

Date: September 19, 2018

Article focus: Oceans, ecosystems

Link: <https://www.snexplores.org/article/new-tools-aim-better-predict-blooms-toxic-algae>

Readability: Grade 8

Title: Ocean heat waves are on the rise - and killing coral

Date: May 18, 2018

Article focus: Oceans, climate, animals

Link: <https://www.sciencenewsforstudents.org/article/ocean-heat-waves-are-rise-and-killing-coral>

Readability: Grade 7

Title: Water waves can have literally seismic impacts

Date: January 12, 2018

Article focus: Earth, geology, physics

Link: <https://www.snexplores.org/article/water-waves-can-have-literally-seismic-impacts>

Readability: Grade 7