



## eCLEAR Evaluation of Scientific Literature

*How to determine if a source is a credible scientific resource?*

### Know This!

**Peer-reviewed** means that a group of experts in the field have examined and validated the work that the author is trying to publish. If the experts in the field decide that the scientific work is not up to par, then the article is rejected and not published or sent back to the author for revisions before it is allowed to be published in the **journal**. A journal is a collection of articles written for specialists in the field. It is challenging to get a research article published in a peer reviewed journal because the group of experts have high standards and are critical of other scientists' work in the field.

A **top tier journal** is one that is eminently respected and has the highest standards required for publication. Examples of some top tier journals in science are: *Nature*, *Science*, and discipline specific journals such as the *Journal of the American Medical Association* or *Journal of the American Chemical Society*.

Because scientific journal articles are written for experts in the field the language can be difficult to understand for those who are not experts. There are other publications that **summarize** the science in the journals in less technical terms. Examples of these types of publications are *Scientific American*, *Discover*, and *National Geographic*, as well as newspapers and other online resources.

***The reader must be able to evaluate that the summary of the original research article is credible and did not distort the researcher's conclusions or data.***



- 1. Describe a peer reviewed journal.
- 2. How can you recognize a top tier journal?
- 3. What should you look for in a summary of a scientific article?

**Example A - Is Secondhand Smoke Dangerous?** - Compare a credible scientific resource with a non-credible scientific resource on second hand smoke.

- "Exposure to Environmental Tobacco Smoke"
- "The Second-Hand Smoke Charade"

*Use the eCLEAR **EVALUATION TOOL** to determine scientific credibility of the 2 resources on secondhand smoke. Your instructor may have you work with a partner or in a group.*

- 4. Which resource is scientifically credible?

*ANALYSIS of the Credible Resource*

- 5. Outline 3 principal points in the credible resource.
- 6. There are no data or graphs in either of these articles as both were editorials. What were the clues that one of the articles was scientifically credible while the other was not scientifically credible?

*REPORT of the Credible Resource*

- 7. Write a brief summary (3 -5 sentences) of the conclusion from the scientifically credible resource.



### **Example B - What are the effects of Ocean Acidification?**

Use the eCLEAR **EVALUATION TOOL** to determine scientific credibility of the 2 articles on ocean acidification.

- “CO<sub>2</sub>, Global Warming and Coral Reefs: Prospects for the Future”
- “Reversal of Ocean Acidification Enhances Net Coral Reef Calcification”

- 8. Which resource is scientifically credible?

#### *ANALYSIS of the Credible Resource*

- 9. Outline 3 principal points in the credible resource.
  
- 10. Examine the data or graphs in the credible resource and try to summarize their meanings to the best of your abilities.

#### *REPORT of the Credible Resource*

- 11. Write a brief summary (3-5 sentences) of the conclusion from the scientifically credible resource.



**Extension Assignment - Find an article on climate change using the resources that your instructor provides and evaluate it using the eCLEAR EVALUATION TOOL.**

**Article Title** \_\_\_\_\_

**Author** \_\_\_\_\_

**Source** \_\_\_\_\_

- 12. Is your resource scientifically credible? If not, find another scientifically credible resource.

*ANALYSIS of the Credible Resource*

- 13. Outline 3 principal points in the credible resource.
  
- 14. Examine the data or graphs in the credible resource and try to summarize their meanings to the best of your abilities.

*REPORT of the Credible Resource*

- 15. Write a brief summary (3-5 sentences) of the conclusion from the scientifically credible resource.



# Next Generation Science Standards (NGSS) Alignment for high school students:

HS-ESS 2-4

HS-ESS 3-5

HS-PS1-6

HS-LS 2-7

HS-LS 4-5

