Writing and Research in Science

How to Find, Use, and Cite your Sources for Papers, Projects, and Presentations

You just got assigned a research paper in science class. Before you begin researching and writing, you need to know the answers to a few questions:

1. What is a good resource?

Not everything you read on the internet is true – whether it's about the Kardashians or the latest scientific discovery. The first step in learning new scientific information is to therefore identify good and trustworthy sources of information. **A good scientific resource:**

- Comes from an **author or organization with a good reputation**
  - *E.g. An article written by Neil deGrasse Tyson or published on the CDC website would be a better source than a college student's blog.*
- Comes from a **reputable publisher (professionally published)**
  - *Articles published in peer-reviewed scientific journals or professionally published books have been edited and checked for accuracy more than many independently published web articles.*
- May have a **more recent date** than previous studies
  - *Science is constantly changing and evolving. New discoveries and research update our knowledge and may contradict older resources.*
- May be **cited by many other authors as true** and is supported by other research
  - *If many other scientists cite it and think it is true, it is probably well-supported information.*
- **Lists their own references**
  - *Good researchers and writers always cite their own resources. If you can't see where they got their information, or that they did the research themselves, you don't know whether or not they are just making up the information.*
- **Uses good experimental methods**.
  - *A good conclusion based on a bad experiment isn't a good conclusion. If their statements come from their own experiments, then the experiments have to be done well.*

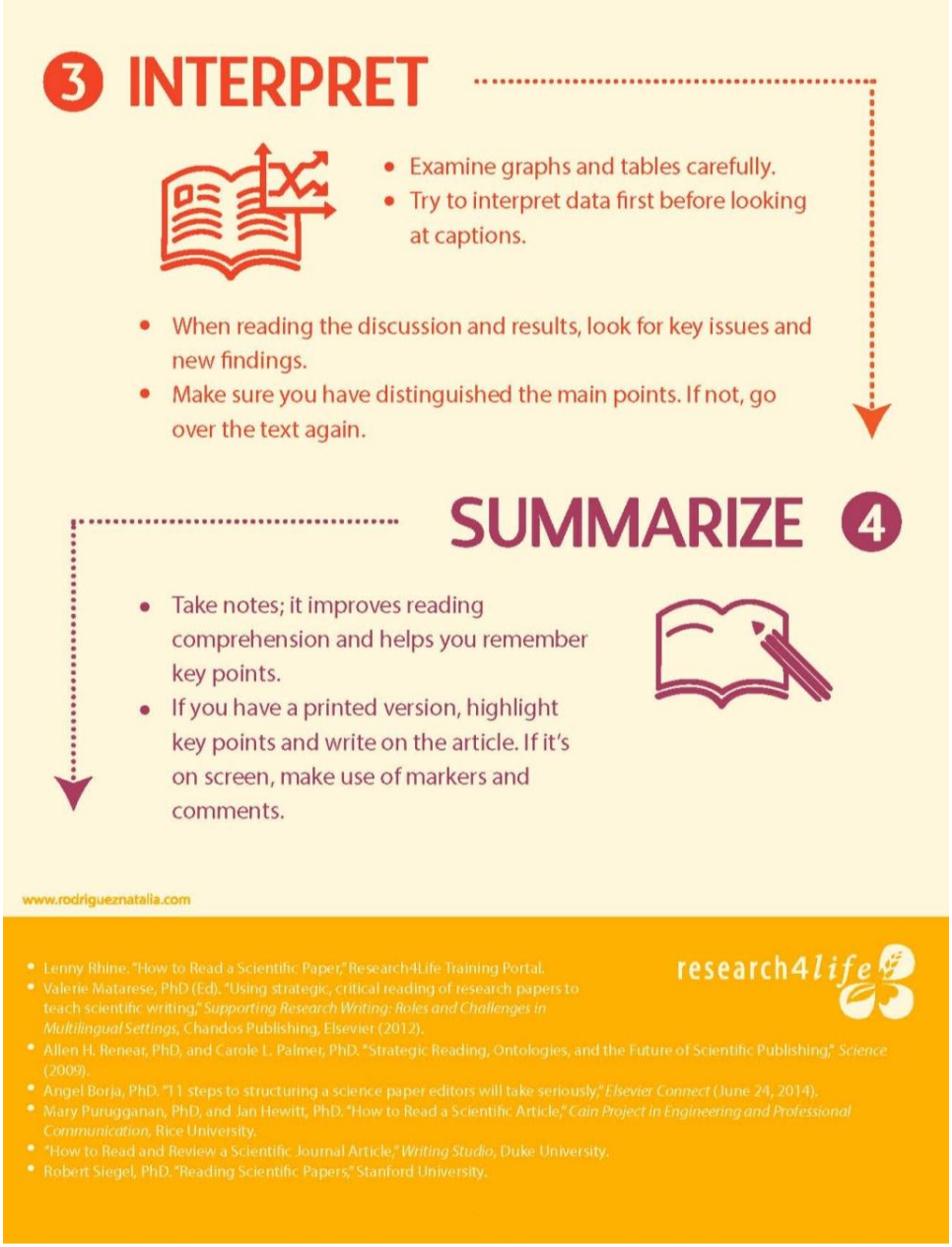
2. Where can I find good resources?

- **The library**
  - Choose books, journals, and articles using the above guidelines.
  - Older books may not have the most up-to-date information.
- **Online ***USE CAUTION!!*****
  - Make sure you are choosing sites with a good reputation!
- **GALILEO : http://www.galileo.usg.edu/high-school/dekalb-k12/search/ (Use High School, Library, or Scholar/Higher Education tabs)**
  - Search for articles on your topic:
    - Browse by Subject > Science and Math
      - Britannica High School *(general information)*
      - Explora for High School, MAS Ultra, National Science Digital Library *(scientific articles)*
  - Search for journals and magazines
  - Search for books on your topic
  - Other Tools

3. How should I read resources?

Reading scientific resources can be tricky. The graphic below outlines some good steps for reading scientific information, particularly scientific research papers.

When you are reading information from a secondary source (like a newspaper, book, or website), also take note on whether the *research* that is being mentioned was done by the *author*, or by someone else. Keep an eye out for any potential bias the writer may have.



Natalia Rodriguez 2015, research4life / Elsevier

How can I efficiently take notes on my resources?

Taking notes, and then writing your project from your notes, helps ensure the information is in your own words and helps you learn the information better than just writing while looking directly at your source text.

- Take notes as you read (see the preceding diagram for tips).
- Take notes *in your own words, by hand.*
- Create note cards. Each card should include the source # or name, topic, one paraphrased idea from your source, and the page it was found on. These cards can then be rearranged to lay out the structure of your paper. For more information on how to make and use notecards in a research paper, visit: http://www.gallaudet.edu/tip/english-center/writing/pre-writing-writing-and-revising/note-card-system.html

How do I use the information from my source in my paper or project – *without plagiarizing?*

Plagiarism is a serious offense. You don't want to do it on purpose, or even accidentally. Here are some ways to avoid it:

Plagiarism Offense	How to avoid it
Copying a sentence or short phrase word-for-word without putting it in quotations	**1) Anything word-for-word must be in quotes, and cited, including page number.** Example 1: As Darwin said, "natural selection works solely by and for the good of each being" (On the Origin of Species, p. 119) Example 2: Smell and taste are linked, so "it is not surprising that an excessively bad odor should excite retching or vomiting in some persons" (Darwin, p. 107) If the quote is more than 4 lines long, it must be presented as a block quote (all indented from the left). **2) Put it in your own words (paraphrase), and still cite it.** - use synonyms - change the order and grammar of the words - only use part of the sentence - if you don't know what it means, look it up!
Using or presenting any information or idea – even if it's in your own words – that wasn't your original thought, without giving credit to the person who wrote it came up with it.	**Include a citation for anything that isn't common knowledge and/or that wasn't your original thought or work, even if it's in your own words!**
Using a picture, graph, video, or other media without citing where it came from	**Include citations for all media you use.**

In other words, cite everything!

How do I cite my resources?

Every project needs a Bibliography or Works Cited at the end : *a properly formatted list of all of the references whose ideas, words, or images you used in your project.*
When writing a paper, you also need to cite your resources throughout the paper using the author's name and publication year.
As you're doing your research, it usually helps to make a "working bibliography" first, even before you actually start writing your text. This helps you easily see and reference your sources as you're writing. After your paper is done, go back and make sure that all of the sources you list in your bibliography are used in your paper, and that you have listed all of your sources.

Citing within your text

Some projects in science, such as PowerPoints, art, brochures, etc., will only have a bibliography attached or at the end.

When you write a paper, however, you need to cite your resources throughout the whole paper *and* have a Works Cited page at the end. You need to cite quotations, images, paraphrased information, *and* ideas that you got from an outside source or are not common knowledge. Because scientists write about things that are not common knowledge, they cite *all the time*, and often have multiple citations in a single sentence! Remember: when in doubt, cite!

- Example 1: Citing after a quote
  - "This is a quote to show how to cite quotes" (Heckman 2016).
  - According to Heckman (2016), "You need to cite quotations and ideas that you got from an outside source".
- Example 2: Citing after an idea
  - Salt marsh terrapins are nesting on Poplar Island now that it has been restored (Roosenburg et al. 2015)
- Example 3: Multiple citations per idea, and per sentence
  - Citations are important (Author 1 Year 1, Author 2 Year 2), and more than one may be necessary per sentence (Author 3 Year 3).
- More examples and rules for formatting in-text citation can be found here: https://owl.english.purdue.edu/owl/resource/747/02/

Citing at the end: Bibliography / Works Cited

A **bibliography** or **Works Cited** is a list of the resources or references used in a project (paper, PowerPoint, presentation, etc.).

- The list is **alphabetized by the author's last name**
- The list **includes each resource cited in your paper/project** – no more, and no less.
- **Each type of resource is listed a little bit differently,** but should include:
  - Author names (first and last)
  - Date published
  - Article title (if applicable)
  - Source title (website, book, journal, etc.)
  - Volume/issue
  - Publisher name and location (for books).
- Don't just copy and paste the URL! That doesn't count as citing!
- For specific guidelines, see: https://owl.english.purdue.edu/owl/resource/747/01/

How can I avoid plagiarism?

Put it in your own words,
Come up with your own ideas,
and
Cite everything!