Primary (Original) Research vs. Secondary Sources in the Sciences

What Are Primary Sources?
Primary articles, also called original research articles, are the original sources for information. Original sources are critical for documenting the validity of information for research projects. The most reliable primary sources of information are likely to be articles in journals that focus on specific areas of research. Primary articles often appear in what are called scholarly or peer-reviewed journals. Secondary articles also appear in such journals, but they serve to review the primary articles of other researchers.

- To confirm that an article is a primary research article, ask the following questions:
  - Does this article give the materials and methods for conducting the research?
    - If it says little about what another researcher must know to repeat the experiment, it is not a valid primary article. Stop right here and evaluate this article as a secondary source of information.
    - If it gives very little, if any, detail about the actual experimental conditions, it is not a valid primary article.
  - Does this article give every detail of the results for experiments that the authors have conducted personally?
    - If it describes only what others have done, it is not a primary research article.
    - If it gives only a summary of results (meaning few details) and no details for statistical or some other form of analysis, it is not a valid primary article.
  - Does the article give complete references to support the claims within?
    - A "complete reference" is an accurate description of any source of information.
    - Complete references enable readers to find and verify the author's sources.
    - Some popular articles also cite complete references, but primary articles always do.
  - Has the article gone through peer review?
    - A valid primary article is one that has been approved by peers (fellow researchers in the same field)
    - An article that satisfies the conditions above is likely to have been peer-reviewed.

What Are Secondary Sources?
Secondary sources are review articles and books. Reporters, technical writers, or even researchers often write them. They summarize one to several studies, usually on the same topic.

- Examples of secondary sources of information are books, popular magazines, newspaper articles, newsletters, and letters to the editor (even if in peer-reviewed journals).
- Even review articles in peer-reviewed journals, written by researchers, are secondary sources that happen to be in the same journals as primary research articles. (Review articles organize and evaluate published research on specific topics, listing complete citations for each research paper cited.
- Articles that quote researchers from oral interviews are secondary sources. The researchers being quoted publish their written work in primary research articles.
- Articles that do not satisfy the criteria for primary sources most likely are secondary.
- Secondary sources may or may not cite complete references for the information within.
  - A "complete reference" is an accurate description for any source of information, so that a reader can locate this source.
  - Review articles in scholarly journals (all of which contain primary articles) always cite complete references.
  - Popular articles may cite complete references, but often include only a few clues as to their sources or none at all.
  - Books often cite references.

Exception: Some 'books' are collections of original research reports from a conference or symposium on some topic. Any article in a book format that satisfies the criteria for primary sources would be a primary article.