

Exercise: Locating Literature

Scientific work gets discussed in different types of literature: popular articles and books, texts and other books for students and scientists, review articles, and research articles. The different types play different roles in helping you hone and master the subject of your research. The popular treatments provide accessible points of entry and overviews that are easy to miss (or are truly missing) with the more technical literature; of course, they lack specificity and may be a little misleading (it's hard to put some complicated ideas into simple language.) Texts and other books for a scientific audience help you connect what you've already learned in classes to the research topic, and give a broader context than individual journal articles; of course they won't give you the most recent or detailed picture of what's happening in your field of interest. The review article also gives a more detailed and recent overview, and gives you a clearer picture of what the open questions are, but if it's a year or two old, then it's missing what's happening *today*, also, you may not be lucky enough to find an review article that focuses deeply enough on your specific subject. Finally, the research article is the 'primary source,' and a recent one can give you the most up-to-date picture of what's happening in the field; however, these are 'works in progress' – some conclusions may prove mistaken; in any event, these are the communications between practitioners, and they can be hard for an outsider to decipher unless you've already read a popular treatment, a text, a review article... more complete and accessible literature.'

So, your assignment is to get some practice identifying these different types of resources (check course schedule for exact dates).

- A) Due Friday: identify (but not necessarily lay hands on) one of each type of writing that bears on your research: a popular treatment, a text book, a review article, and a peer-reviewed research article.
- B) Due next Friday: have actually acquired and read these works and write a brief (a paragraph or two for each) discussion of each one's primary audience, utility for your work researching your topic, and weaknesses for your work researching your topic. (note: if a piece is on interlibrary loan – you may have an extension on that one piece until a week after it arrives.)
- C) Due the following Friday: schedule a follow up with Paige Mann to help you flesh out your resources – maybe it's just a quick check-in if things are going well, or maybe it's a more detailed bit of help if you're having difficulty.

What follows are a few notes on finding different types of sources.

Regarding books

Regardless of their target audience, books about scientific subjects generally have the strength of providing the broadest overview / context, and also good leads for further readings of other types (popular treatments, research articles, and review articles) in their citations and bibliographies. As you know, generally to find books, you can use the library's search tools. You'll likely find a mix of titles pitched to the three different audiences: non-technical, "popular science" treatments for the interested non-scientist; textbooks for students like you (some for undergrads and some for graduate students); and technical books pitched to researchers and graduate students. When specifically looking for textbooks, there are two other places I often start my search. There are a handful of major science textbook publishers, such as Wiley (look at the spines of the textbooks on your shelf for more), so I check out their

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websites. Another place to start is searching the web for courses in the area you're interested in, and then seeing what texts *they* use. In either case, this is just the start of your search. The next step is going to a bookseller's site, like Amazon's or Barnes and Noble's, and looking up some of the texts you'd found; this will return some information about the text but, more valuably, it will also return the 'shoppers also looked at' kind of list as well as reviews (including some official ones and some personal ones – which have to be taken with a grain of salt, but you know that).

Regarding popular-science articles

There are a handful of magazines that exclusively write articles about science and technology for the general audience, so I'd go straight to their sites and search their lists of articles for your topics. Some of these are *Science News*, *Scientific American*, *Discover*, and *Wired*. Of these, I regularly read *Science News* and *Wired*, both are quite accessible reads, but *Science News* is more 'reporting' while *Wired* is more 'editorializing' (often with a rah-rah-technology perspective.)

Regarding (Peer-Reviewed) Research Articles

For filtering specifically for peer-reviewed articles (as opposed to also catching popular-press treatments), generally inspec returns those; all scholarly articles (with the exception of some conference proceedings) will have undergone peer review. If your search brings up a promising title, but it's really long (like fifty pages), then you've stumbled upon not a *research* article, but a *review* article (see below.) Also, if you know a faculty member who works in the general area that you're interested in (doesn't have to be an exact fit) he/she may be able to identify for you the leading journals for that field; for example, if someone wanted peer-reviewed research articles in my area, I'd point them to *Physics Review B* and *Surface Science*. Note that, while inspec may point you to the appropriate *journal*, and you should cite the article according to its placement in that journal, you can often find a free copy elsewhere, and that may become more common as the White House pushes for federally-funded research to be freely accessible to the citizenry that paid for it.

Regarding Review Articles

Despite the "Review" in their names, *Physics Review Letters*, *Physics Review A*, *B*, *C*,... don't tend to carry "review articles"; they carry "research articles." For Physics, the *Review of Modern Physics* is dedicated to carrying review articles, and for scientific instrumentation, the *Review of Scientific Instruments* carries them (though it's not exclusively review articles or exclusively physics.) In inspec, one of the filters you can select (left menu that becomes available after you've initiated a search) is "Review and Tutorial Papers Resource Letters"; that'll be handy.