1. Books

Although the distinction is getting fuzzy as more and more resources are available on the web, it is still largely the case that the web provides “fast food for the mind” and a really nourishing feast requires consulting books. That is, web sites seldom contain the level of depth and detail that can be found in books – people who put in the effort needed to write a book usually want to get some payment for it!

However, it is not safe to assume that every book is written by a knowledgeable authority and represents an unbiased view of the topic. In fact, for a few hundred dollars anyone can get a book published through “publish on demand” (POD) services. The largest such publisher, Lightning Source, claims to have hundreds of thousands of titles available. Traditional publishers generally are cautious about what they print (they do not want to lose money) and often have books reviewed before they accept them, a process a lot like peer-review for scientific papers, discussed below in Section 3. Therefore, a first check on a book is the nature of the publisher. In fact, you can get a lot of information from the Library of Congress (LOC) listing of the book – here is the url for the LOC catalog:

http://catalog.loc.gov/cgi-bin/Pwebrecon.cgi?DB=local&PAGE=First

If the book is not there, then Amazon has some of the same information. Let’s assume that you were successful at the LOC. The publisher will be listed, but you will have to go to their web site to see what kind they are (POD or regular, etc.) and whether they specialize in the general area of the book – a good sign, if they do. The LOC will also provide the table of contents. Check that the title of the book matches the topics in the table of contents and that the book seems to have a reasonable flow of logic. Another legitimate type of book might have independent chapters collected and bound together, but this might not be what you are looking for in your research, since there will be less control over the flow of logic and perhaps less of an overview of the general subject. Check the date of publication – for topics that are moving quickly, such as global climate change, a book published a long time ago is probably not as useful as a newer one. For other topics, a good older book is a lot better than a so-so new one. Has the book been republished in new editions? That is also a good sign, since it means the book sold well and a lot of people found it useful.

Here are some more checks. If you are suspicious about the author, and he/she claims scientific credentials, you can check them and whether the author has relevant specialties for the book in the same way we have suggested for web sites, using the Science Citation Index, discussed in Section 2. Even more useful might be to get the opinion of experts. For example, libraries generally evaluate books carefully before buying them, so it would be great to know if lots of libraries thought the book was important. Here is how to find out.
Go to the University of Arizona library home page,

http://www.library.arizona.edu/

At the top set of boxes, click on the tab labeled "books," enter the book title in the search box that comes up, and click search. If you get multiple hits, click on the title for the one you want and you will eventually get a page with just the information on your book (another chance, by the way, to get the publisher and the table of contents). Scroll down the page and you will see a link “+worldwide libraries own this item.” It will return not only the number of libraries holding the book, but will list them. If a lot of libraries have bought the book, it is an indication that it was viewed as a valuable one. Another interesting tab is the one on “editorial reviews,” which returns evaluations views by professional reviewers. The link below, “user-contributed reviews” gives any reviews filed at Amazon, among other sources. They need to be treated with caution, since they are often just provided by readers with no checking – a totally wrong book with a cult following, such as one advocating the presence of civilizations on Mars, might have a lot of very favorable reviews. However, check them out – maybe such a book will have a few very negative ones also, which will warn you that the book is controversial.

Another way to get reviews is to go back to the library home page,

http://www.library.arizona.edu/

and this time click on “Search and Find,” “Reference Resources” and then on “Publisher Information” and finally on “Global Books in Print.” Enter the information on your book in the search area and see what comes back. If the book is still available for purchase, you will be directed to a page with a lot of the information you got from the libraries. If the book has a star next to it in the listing, there will also be a tab for “Title Reviews”. Clicking on it should give you a selection of reviews of your book.

Although they come with no guarantee, using these methods to check out books will help you both find books that are useful for your research, and also warn you if a particular book might have biases or inaccurate information.
2. Websites

You will be inclined to get most of your information from web sites because it seems so effortless compared with consulting books. That is their huge advantage, of course; you can search all around the world for information just from your laptop computer. The disadvantages we also know – there is no infrastructure to judge the quality of the information similar to the approaches that can be used with books.

A first way to get more reliable information is to use a search engine that evaluates the sites. The Internet Public Library is just such an engine:

http://www.ipl.org/

It works just like more familiar search engines, but the sites it brings up have been screened by librarians for their content and each comes with a short description of its content.

However, there just aren’t enough librarians in the world to evaluate all the sites you might want to consult, so you will also end up using a conventional search engine like Google or Yahoo. You can tune up your technique on them also – we will illustrate how using Google. Instead of just typing a word or two and searching, click on the “advanced search” link to the right. You will get a html form that lets you enter multiple words with logic rules for how they will be used in the search – exact phrase, one of a number of words, and so forth (top section). Under “Need more tools?” the most interesting choice is the domain. If you enter .edu, you will only get hits associated with approved educational institutions; if you enter .gov, you will get hits from government web sites, and so forth (other useful domain names include .org, .com, and the two-letter country designators). In general, a government web site, and usually an educational one also, will be more likely to post carefully reviewed and reliable information than you will find at a random site with no restrictions. Click on the Date, usage rights, numeric range, and more (and select from the choices) to restrict the search to recent information.

Now that you have candidate sites, you need to evaluate them – they come with no guarantee. First, don’t sell yourself short - try your common sense. Does the site seem well reasoned? Does it give fair hearing to various points of view, or does it seem argumentative? Of course, you might be misled, but if you are suspicious, it can be a useful warning sign. Anyway, it is good to start here to see if your first impression survives probing deeper.

You are going to have to test your impressions by using the web to evaluate some key points about each site. Let’s start with some very general criteria you can apply to nearly all sources of information. Most sites with good information will include some of the things you need to know to evaluate them, such as: a.) identifying the author and any organization sponsoring the site; and b.) providing a bibliography – identifying where the author got his/her information and doing so in enough detail that you can check it for yourself. Sometimes to get this information it helps to delete the end entries in the url to go up the internal links to the homepage. If the site
includes a bibliography, check a few of those sources – do they seem reliable (that is, qualified authors, good reasoning, and so forth). What are the overall qualifications of the author to evaluate the topic of the article? Perhaps you can find out more about the author through additional searches on the web. Some really interesting insights can be obtained by putting the address of the site into the “Find pages that link to the page:” on the advanced Google search page. You will be able to see if the site is part of a network of fringe sites or is in the mainstream.

The information from the site needs to be checked and perhaps expanded. To do so, you will have to do some searching. A decent place to start is Wikipedia – unlike conventional encyclopedias, it often has information on current issues. However, unlike conventional encyclopedias, it is conceivable that someone slips a misleading article into Wikipedia, so it is a good idea to check further also.

Here are some more issues. Does the author seem to have ulterior motives or conflicts of interest - is he or she trying to sell something for money, or pushing a political point of view too hard, for example. Is the information on the site well reasoned? Here you must be very careful because if you agree with the argument you are likely to think it is well reasoned and if you disagree you will think it is not. You really do not want your bias to determine your decision.

In evaluating authors of sites and those they quote, searching the web can be tedious and may pose endless issues of judging the reliability of web sites. If someone is advertised as a scientist, you can get an unbiased overview quickly from the Science Citation Index. Go to the library:

http://www.library.arizona.edu/

Click on “Search and Find” and then “Articles and Databases”. Then click on “S” and “Science Citation Index.” Enter the person’s name and click on search – all the peer-reviewed articles he/she has written will come up. If more than one person seems to be involved in the results, you can narrow the search by clicking on “analyze results” and picking from the menu for subject, place, year, and so forth. Once you have narrowed the listing to the person you are seeking, you can see immediately whether they have written scholarly articles in an area relevant to the one they are being quoted about. You can also see if they have been active recently, or if their last article was a long time ago (suggesting they may have gotten out of touch). A quick, ruthless, and approximate indication of the quality and impact of their work can be obtained by clicking on “create citation report.” It shows all the times that their work was cited in some other scientific article – generally good work is cited many times, and bad work is ignored.

Farther down the list of library options, you will also find the “Social Science Citation Index.” It works like the Science Citation Index but in areas like anthropology, sociology, urban studies, business and communication, criminology, penology, law, nursing, rehabilitation, and information and library sciences. There is also an “Arts and Humanities Citation Index” so you can use these tools to check the qualifications of experts in many different areas.
3. Articles

You probably already know the basic difference between academic and popular articles. Academic ones are required to identify sources of their information and to include this information in a bibliography. You also need to know the difference between academic articles that are peer-reviewed and those that are not. Peer-review means that before the work is published, it is sent to a number of experts in the general area. They read it and critique everything from the writing style to the correctness of the results. This process can be quite arduous, but it substantially reduces the amount of incorrect or misleading material that gets published. Peer-reviewed articles are the gold standard for science and represent the most reliable source of information. On the other hand, academic articles can also come out in ways that are not peer-reviewed, and then there are no real checks on what they say. Popular articles do not include the full formality of an academic bibliography. They can be as rigorous as academic articles, nonetheless, or they can be nonsense. One useful guideline is where they are published. A recognized news magazine is likely to have “safer” articles than a blog on the web.

Still, for any articles not peer-reviewed, you might consider using some of the same checking strategies discussed above under web sites.