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Chapter 1 : Technical report - Wikipedia

Scientific and technical information sources. [Ching-chih Chen] -- Guide to current reference sources of science and technology. Intended primarily for information professionals and their assistants in science and engineering, as well as a textbook for library and.

They filled the test tubes, analyzed the data, or designed the particle accelerator, or at least supervised those who did. Many, but not all, journal articles are primary sourcesâ€”particularly original research articles. A secondary source is a source presenting and placing in context information originally reported by different authors. These include literature reviews , systematic review articles, topical monographs, specialist textbooks, handbooks, and white papers by major scientific associations. News reports are also secondary sources, but should be used with caution as they are seldom written by persons with disciplinary expertise. An appropriate secondary source is one that is published by a reputable publisher, is written by one or more experts in the field, and is peer reviewed. University presses and other publishing houses known for publishing reliable science books will document their review process. A tertiary source usually summarizes a range of secondary sources. Encyclopedias, general textbooks, popular science books, and tables of values are tertiary sources. Basic advice[edit] Respect secondary sources[edit] In general, scientific information in Wikipedia articles should be based on published, reliable secondary sources, or on widely cited tertiary and primary sources. Sources that are robust in methodology, published in high quality venues, and authored by widely cited researchers are preferred. Especially for surprising or extraordinary results, the description should adhere closely to the interpretation of the data given by the authors or by reliable secondary sources see Wikipedia: Primary sources should be used when discussing a particular result or recent research directions. When citing a primary source, be especially mindful of the policy on undue weight , as primary sources are more prone to misuse than secondary or tertiary sources. An individual primary source should never be cited or juxtaposed so as to "debunk" or contradict the conclusions of a reliable secondary source, unless the primary source itself directly makes such a claim see Wikipedia: Synthesis of published material that advances a position. Primary sources favoring a minority opinion should not be aggregated or presented devoid of context in such a way as to undermine proportionate representation of expert opinion in a field. If a reliable and comprehensive review article cites a study, result, or idea, the review should usually be cited in preference to the primary paper. If a paper is cited by few or no reliable sources outside the originating lab, the primary source should be removed as not reporting an important result. Wikipedia does not apply any special emphasis to breaking news , but seeks an overall survey of the literature as it has been synthesized by the experts in a field. Tertiary sources can provide a valuable overview of a topic, but often oversimplify complex material. It is usually better to cite the secondary or primary literature directly. Although popular-press news articles and press releases may tout the latest experiments, they often exaggerate or speak of "revolutionary" results where the researchers refer to the context of the gradual progress of the field. Including an accessibility link to such a source may aid in reader comprehension, but the language of the actual study should be used; more detailed and less sensational lay sources are preferred. In all cases, the reliability and relevance of a work is determined by other researchers in the relevant field. Using high-quality sources ensures that our articles reflect the current state of knowledge and proportionately represent the aspects and controversies considered most important by the experts in a field. Respect primary sources[edit] A primary source, such as a report of a pivotal experiment cited as evidence for a hypothesis, may be a valuable component of an article. A good article may appropriately cite primary, secondary, and tertiary sources. Use of primary sources should always conform to the No original research policy. However, primary sources describing genetic or genomic research into human ancestry, ancient populations, ethnicity, race, and the like, should not be used to generate content about those subjects, which are controversial. High quality secondary sources as described above should be used instead. Genetic studies of human anatomy or phenotypes like intelligence should be sourced per WP: Summarize scientific consensus[edit] See also: Scientific consensus The prevailing scientific consensus should be presented as the dominant view and articles should be framed accordingly. Scientific consensus can be found

in e. Significant minority views should be accorded due weight and presented in the context of their acceptance by experts in the field. If mainstream secondary sources in a field do not consider a detail or opinion relevant, it may not be appropriate to cover it at that article; such details and opinions may be desirable at an article on a sub-topic or at a separate article, with linking governed by WP: The fact that a statement is published in a refereed journal does not make it true. Even a well-designed experiment or study can produce flawed results or fall victim to deliberate fraud. There is an informal hierarchy of journals, abetted by the publish or perish culture of academia. Preference should be given to citing articles in top tier journals wherever possible. Similarly, if you find dubious unreferenced or poorly referenced text in an article, your first question should be does including this material add to the full and accurate summary of the topic rather than can I track down a source somewhere that supports this. The fact that a statement is published in a refereed journal does not make it relevant. Many ideas are proposed and disregarded in the context of scientific discourse. If an idea is cited by a small minority of researchers, but rejected or ignored by the majority of researchers in a field, it should receive limited weight according to its acceptance; ideas held by a tiny minority of researchers need not be reported in our articles, except in articles devoted to these ideas. Very new papers should be used sparingly until enough time has passed to make this assessment - there is no deadline. Additionally, material that is appropriate for a highly focused article on one specific part of a field may not be appropriate for a higher level article about the field as a whole. Make readers aware of legitimate uncertainty or controversy within the particular field of study. A well-referenced article will point to specific journal articles or specific theories proposed by specific researchers. Wikipedia neither accepts nor rejects any particular position - describe any disputes and their place in the scientific discourse, but do not engage in them. Many values, such as the masses of transuranian elements or the isotopic composition of the solar system, have an associated uncertainty, and even up-to-date highly reliable sources may report slightly different values. For values or classes of values affecting many articles, consistency across articles and Wikiproject-level discussion should be preferred. Political, social, and historical context and impact and public perceptions are important when deciding whether to cover an idea at an article, but should not be considered when assessing scientific consensus. Assess evidence quality[edit] WP: SCIASSESS Editors should be careful to avoid engaging in original research , but the quality of available evidence should be kept in mind when assessing whether a particular idea or viewpoint is well-accepted by the relevant academic community. Such evidence should include reviews of the literature including the work of several different research groups. Individual papers often disagree with each other, but there are several indicators that may be assessed even without specialist knowledge to differentiate high quality papers from low, including: The paper has been appropriately reviewed through formal or informal peer review. Any serious scientific journal is formally peer-reviewed , though white and gray literature may be less transparent in their review methodology. Experimental and mathematical methods are clearly explained and are appropriate to the experiment. Model fitting and statistical analysis are meaningful and appropriate. Funding sources and any potential conflicts of interest are disclosed. These conventions may vary by field, journal, and paper. Recognized experts in the field have commented or offered informal opinion. Cutting edge science is built on the foundation of previous research, and paradigms almost always change only slowly. Preliminary results, whether reported in the popular press, a conference abstract, or a peer-reviewed journal, are a form of anecdote and generally fall below the minimum requirements of reliable science sources. Exceptional or surprising claims should not be presented as authoritative, nor should the description of a broad consensus view be presented as less well-founded until such exceptional claims are replicated or widely cited. Be careful of material in a journal that is not peer-reviewed, especially if reporting material in a different field see Marty Rimm and the Sokal affair. Speculative proposals and early-stage research should not be cited in ways that suggest wide acceptance. A secondary source reporting on preliminary results might be appropriate as part of a well-documented section on research directions in a field. To prevent misunderstandings, the text should clearly identify the level of research cited. If a result does not accurately indicate its place in the scientific discourse, it is unlikely to be reliable. For example, every year, people propose modifications to general relativity or publish results that call some aspect of the theory into question. Usually these ideas are proposed

by serious researchers who pose a question as part of an endeavor to understand the results more deeply: Such nuances are often missed in popular press reports, but should be included in articles if the proposed modification is cited. Sometimes "revolutionary" ideas are proposed by cranks or are otherwise ignored by researchers; such ideas should be presented only in the context of the broader field and only in articles devoted to the proponent s or specific to the idea. Until a significant fraction of the astrophysics community indicates doubt as to the general validity of the theory, the articles treating general relativity should not imply any such doubt. Use up-to-date evidence[edit] While articles should be kept up to date by citing current literature, care should be taken to avoid recentism , focusing too much on new sources that have not yet been evaluated by the relevant community. Here are some rules of thumb for keeping an article up-to-date while maintaining the more important goal of reliably reflecting the current state of a field of research. These guidelines are appropriate for actively-researched areas with many primary sources and several reviews, and they may need to be relaxed for mature fields or in areas where little progress is being made and few reviews are being published. Look for reviews published in the last five years or so, preferably in the last two or three years. The range of reviews examined should be wide enough to catch at least one full review cycle, containing newer reviews written and published in the light of older ones and of more-recent primary studies. Within this range, things can be tricky. Although the most-recent reviews include later research results, do not automatically give more weight to the review that happens to have been published most recently. The prominence of the publishing journal, the quality and comprehensiveness of the review, and the respectability of the authors should also be taken into account. Prefer recent reviews to older primary sources on the same topic. If recent reviews do not mention an older primary source or result, the older source is dubious. For example, the articles superconductivity and List of superconductors might mention the hot-off-the-presses latest material or model found to undergo the transition, but such observations should be treated as tentative until confirmed by another research group or affirmed by a broad review of the field. More detail should be devoted to discussion supported by recent reviews. These are just rules of thumb. History sections often cite older work, for obvious reasons. An older primary source that is seminal, replicated, and often-cited in reviews is notable in its own right and can be mentioned in the main text in a context established by reviews. Consider scope and focus: Editors should be especially leery of citing papers making exceptional claims until the relevant community has evaluated the evidence. If a result is cited only by the research group originating the claim and ignored by the rest of the field, it should probably not be included even if present in a review authored by the group. Blogs by relevant subject matter experts may be useful in talk page evaluation of the relevance of very new results, though they should rarely be cited themselves see below. Sometimes scientific results have or are taken to have political or social relevance. Wikipedia articles should avoid sensationalism, and should follow the relevant research community in according weight to such results. Reporting on political and social impacts and controversies is often done in separate article sections, and sometimes separate articles.

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Get this from a library! Scientific and technical information sources. [Ching-chih Chen] -- Guide to current reference sources of science and technology. Intended primarily for librarians in scientific and engineering fields.

As such, every science or engineering lesson is in part a language lesson, particularly reading and producing the genres of texts that are intrinsic to science and engineering. NRC Framework , p. NRC Framework, , p. Being a critical consumer of information about science and engineering requires the ability to read or view reports of scientific or technological advances or applications whether found in the press, the Internet, or in a town meeting and to recognize the salient ideas, identify sources of error and methodological flaws, distinguish observations from inferences, arguments from explanations, and claims from evidence. Scientists and engineers employ multiple sources to obtain information used to evaluate the merit and validity of claims, methods, and designs. Communicating information, evidence, and ideas can be done in multiple ways: A major practice of science is thus the communication of ideas and the results of inquiryâ€”orally, in writing, with the use of tables, diagrams, graphs, and equations, and by engaging in extended discussions with scientific peers. Science requires the ability to derive meaning from scientific texts such as papers, the Internet, symposia, and lectures , to evaluate the scientific validity of the information thus acquired, and to integrate that information. Engineers need to be able to express their ideas, orally and in writing, with the use of tables, graphs, drawings, or models and by engaging in extended discussions with peers. In engineering and science alike, new technologies are now routinely available that extend the possibilities for collaboration and communication. Science and Engineering Practices in the NGSS Scientists and engineers must be able to communicate clearly and persuasively the ideas and methods they generate. Critiquing and communicating ideas individually and in groups is a critical professional activity. Communicating information and ideas can be done in multiple ways: Scientists and engineers employ multiple sources to obtain information that is used to evaluate the merit and validity of claims, methods, and designs. K-2 MS HS Obtaining, evaluating, and communicating information in Kâ€”2 builds on prior experiences and uses observations and texts to communicate new information. Obtaining, evaluating, and communicating information in 3â€”5 builds on Kâ€”2 experiences and progresses to evaluating the merit and accuracy of ideas and methods. Obtaining, evaluating, and communicating information in 6â€”8 builds on Kâ€”5 experiences and progresses to evaluating the merit and validity of ideas and methods. Obtaining, evaluating, and communicating information in 9â€”12 builds on Kâ€”8 experiences and progresses to evaluating the validity and reliability of the claims, methods, and designs. Describe how specific images e. Compare, integrate and evaluate sources of information presented in different media or formats e. Obtain information using various texts, text features e. Gather, read, synthesize information from multiple appropriate sources and assess the credibility, accuracy, and possible bias of each publication and methods used, and describe how they are supported or not supported by evidence. Practices, Crosscutting Concepts, and Core Ideas pages By grade 12, students should be able to Use words, tables, diagrams, and graphs whether in hard copy or electronically , as well as mathematical expressions, to communicate their understanding or to ask questions about a system under study. Read scientific and engineering text, including tables, diagrams, and graphs, commensurate with their scientific knowledge and explain the key ideas being communicated. Recognize the major features of scientific and engineering writing and speaking and be able to produce written and illustrated text or oral presentations that communicate their own ideas and accomplishments. Engage in a critical reading of primary scientific literature adapted for classroom use or of media reports of science and discuss the validity and reliability of the data, hypotheses, and conclusions.

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