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| ***Techniques for Documenting with Proof or Supporting Evidence, and Related Strategies for Problem Solving***  **By David Alderoty © 2016**  **Chapter 21)Technique-20,Physical Evidence,**  **And Related Concepts**  [**This e-book presents 28 techniques for supporting the validity of the statements you write**](http://www.TechForText.com/DP/List)**.**  **Left click on the above for a list of the techniques**  **This chapter contains a little over 1200 words**  **If you want to go to chapter 20, left click on the following link:**  [**www.TechForText.com/DP/chapter-20**](http://www.TechForText.com/DP/chapter-20)  **To contact the author use David@TechForText.com**  [**or left click for a website communication form**](http://www.david100.com/Mail)  **Table of Contents, and an Outline of this Chapter**  The following is a hyperlink table of contents, as well as an outline of this chapter. If you left click on a blue underlined heading, the corresponding topic or subtopic will appear on your computer screen. Alternatively, you can scroll down to access the material listed in the table of contents, because this chapter is on one long webpage.  [Topic 1.) Technique-20, Physical Evidence 3](#_Toc476829856)  [**Subtopic, \*A Note on Evidence in Criminal Investigation** 4](#_Toc476829857)  [**Subtopic, Writing about Physical Evidence That is Documented in Published Sources** 5](#_Toc476829858)  [**Subtopic, Using Google Maps, Earth, Moon, Sky, and Mars, to Find Physical Evidence, or to Find a Topic To Write about that Involves Physical Evidence** 6](#_Toc476829859)  [**Subtopic, If the Physical Evidence is Your Original Discovery** 7](#_Toc476829860)  [**Subtopic Describing Physical Evidence Accurately, Without Contaminating the Description with Assumptions** 7](#_Toc476829861)  [**Subtopic, Avoid Inadvertent Erroneous Interpretation of Physical Evidence** 8](#_Toc476829862)  [**Additional and Supporting Information For this chapter from the Web** 9](#_Toc476829863)  **This E-Book Provides Additional and Supporting Information from other Authors, with Web Links**  This e-book contains links to web-based articles and videos from other authors, for **additional, alternative, and supporting information.** The links are the blue underlined words, presented throughout this e-book. However, some of these links are to access different sections of this e-book, or material on my own websites.  Quotes and paraphrases in this e-book have hyperlinks to access the original source. The quotes are presented in brown text, which is the same color of these words. (The precise text color is RGB Decimal 165, 42, 42, or Hex #a52a2a)  Some of the web links in this e-book will probably fail eventually, because websites may be removed from the web, or placed on a new URL. If a link fails, use the blue underlined words as a search phrase, with [www.Google.com](http://www.google.com/) If the link is for a video, use [www.google.com/videohp](http://www.google.com/videohp) The search will usually bring up the original website, or one or more good alternatives. |

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| ***For those who prefer listening, as an alternative to reading, this book is recorded in an audio format.***  [***For an audio narration of this chapter, left click on these words (requires 10 minutes, and 14 seconds).***](P1.mp3) |

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| **Topic 1.) Technique-20, Physical Evidence**  |||  Technique-20 involves supporting the validity of statements you write with **physical evidence**. For example, fossils of dinosaurs prove that dinosaurs lived on planet Earth. **Physical evidence** is extensively used in the sciences, and [paleontologist](https://sites.google.com/site/kskhmlbiologyandevolutionlhs/evidence-of-evolution/paleontology) searching for fossils is one example. [Archaeologists](http://www.saa.org/Default.aspx?TabId=1346) search for physical evidence of ancient civilizations. [Geologists](http://geology.com/articles/what-is-geology.shtml) look for physical evidence to evaluate geological hypotheses, and to find mineral deposits, and fossil fuels. [Criminal investigators](https://www.nij.gov/topics/forensics/Pages/welcome.aspx) searched the crime scene for physical evidence, to apprehend and convict criminals**\***. However, chemists, and other experimental scientists, carry out experiments to obtain physical evidence. That is experimental results are usually some form of physical evidence.  The technique that I am discussing in this topic overlaps with technique-19, which dealt with displaying **original or creative work** as proof or supporting evidence. Original or creative work is also a type of physical evidence. Thus, the strategies used with technique 19, are somewhat similar to the strategies used with technique 20.  **Subtopic, \*A Note on Evidence in Criminal Investigation**  |||  [Criminal investigators divide the concept I am discussing in this topic, into two categories, which are **biological evidence** and **physical evidence**.](http://www.encyclopedia.com/science/encyclopedias-almanacs-transcripts-and-maps/physical-evidence) I am using one category, because biological evidence involves chemical traces that are physical in nature. In addition, from the point of view of the writer, biological evidence is treated the same way as any other category of physical evidence, with one exception. Specifically, if you are writing about criminal investigation or [forensic science](https://www.nij.gov/topics/forensics/Pages/welcome.aspx), you should label the evidence as either biological or physical evidence.  **Subtopic, Writing about Physical Evidence That is Documented in Published Sources**  |||  When you are writing involves a topic, and/or physical evidence that is documented in published sources, you could use the conventional citations strategy. In this case, the citations confirm the validity of the physical evidence, which are used to support the validity of your statements and claims. If the physical evidence is displayed in a museum, you can also use the museum as the reference. If your topic, and/or physical evidence, involves a city, nation, or large wilderness area, it is most likely documented in published sources. Some examples are the [**Rocky Mountains**](https://www.nps.gov/romo/index.htm)**, the** [**Grand Canyon**](https://www.nps.gov/grca/index.htm)**, the** [**South Pole**](http://astro.uchicago.edu/cara/vtour/pole/)**,** [**Niagara Falls**](https://www.tripadvisor.com/Tourism-g48261-Niagara_Falls_New_York-Vacations.html)**,** [**Yellowstone National Park**](http://www.yellowstonenationalpark.com/)**,** [**Howe Caverns**](http://video.nationalgeographic.com/video/inside-howe-sci)**,** [**Chernobyl**](http://www.world-nuclear.org/information-library/safety-and-security/safety-of-plants/chernobyl-accident.aspx)**,** [**New York City**](https://www.google.com/search?q=New+York+City+encyclopedia.com&site=webhp&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiZuL-_2MjSAhXKSSYKHV-FDycQ_AUICCgD&biw=1707&bih=844&dpr=1.13)**,** [**Times Square**](https://www.google.com/search?q=Times+Square&rlz=1C1OPRA_enUS705US705&espv=2&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiyzvv51cjSAhVM5iYKHfqcAck4ChD8BQgIKAM&biw=1707&bih=844)**.** The above are the topics for writing project.  Physical evidence that is documented in published sources can sometimes be personally investigated by the writer, such as the above examples. When this is the case, citation from published sources can be reinforced with your own personal photographs and/or videos. Photographs can also be used without any citations from published sources, if you are dealing with locality, or structures that are well known. When the physical evidence involves a large geological or geographical entity, writers may be able to make their own personal discoveries, and document them with photographs and text.  **Subtopic, Using Google Maps, Earth, Moon, Sky, and Mars, to Find Physical Evidence, or to Find a Topic To Write about that Involves Physical Evidence**  |||  Google has a number of specialized search engines and software that are designed for searching for locations and structures on the earth, moon, space, and Mars. Most of these searches provide either maps and/or photographs. This includes pictures taken from street-level, as well as from satellites. The search engines can be access, and the software can be downloaded, from the web links presented below/   * **Google Maps,** see[www.google.com/maps](http://www.google.com/maps) click on the icon labeled **Earth** to obtain a satellite view * **Google Earth** see [www.google.com/earth](http://www.google.com/earth) To download the latest version of Google Earth see [www.google.com/earth/download/ge/agree.html](http://www.google.com/earth/download/ge/agree.html) * **Google Moon**, see [www.google.com/moon](http://www.google.com/moon) * **Google Mars** see [www.google.com/mars](http://www.google.com/mars) * **Google sky** displays the stars and planets, see [www.google.com/sky](http://www.google.com/sky) Also see About Google sky at www.google.com/sky/about.html   **Subtopic, If the Physical Evidence is Your Original Discovery**  |||  If the physical evidence is your original discovery, and it is **not** documented in a reliable published source, it might be more difficult to convince the reader that your evidences valid. Simply describing the evidence will probably be inadequate. However, if you add photographs and/or video to the description your evidence is more likely to be believable. Ideally, you should provide the location of the evidence, so that readers can examine it for themselves. This is quite feasible when the physical evidence involves large structures created by nature, or architecture created by humans. If your evidences a small structure, it may be feasible to display it directly to the readers. This is possible if you are dealing with a small group of readers, such as in a university or corporate setting.  **Subtopic Describing Physical Evidence Accurately, Without Contaminating the Description with Assumptions**  |||  When you are writing about physical evidence, you have two sections that should not be intermingled. The first is your description of the physical evidence, which ideally should include photographs and/or videos. Your description should be based on observable facts, which can be seen by others who have appropriate training. Your interpretation, and/or hypotheses that relate to the physical evidence should **not** be placed in the same paragraph as your description. If the evidence is a major component of your document, your description of the evidence, and your interpretation and/or hypothesis should be placed in separate sections. The section should have labels indicating, description of evidence, and interpretation of evidence.  **The ideas and suggestions presented above are especially important when the physical evidence is your own discovery.** When you are dealing with evidence from published sources, the material in this subtopic might be less important, or even irrelevant, with one exception. Specifically, if you are interpreting the evidence you obtain from published sources, in an original or in usual way, then the strategies presented above should be applied in most cases.  **Subtopic, Avoid Inadvertent Erroneous Interpretation of Physical Evidence**  |||  Your interpretation of the physical evidence, and hypothetical concepts should be supported by the evidence. A simple way to avoid irrational assumptions is to ask people with a scientific background, to examine your writing, see if you made any unreasonable assumptions.  There are many examples of irrational interpretations of physical evidence on the web. An example of and irrational interpretation of evidence is often seen when people claim they are seeing flying sources, or spaceships, from other planets. This of course is unreasonable, because there are so many strange looking flying objects that human beings have created over the last hundred years. This includes balloons, kites, miniature airplanes, drones, jet aircraft with unusual shapes, and satellites. In addition, there are large number of natural objects in the sky, including meteors, stars, planets, comets, and occasionally unusually shaped clouds and lightning.  In general, it is difficult or impossible to identify every object seen in the sky, on the ground, or in the oceans. If an entity can be identified, or cannot be explained, it does not logically follow that it is from another planet.  **Additional and Supporting Information For this chapter from the Web**  |||  [Chemistry: Evidence of orbitals](http://chemistry.stackexchange.com/questions/16207/evidence-of-orbitals)  [Fossil evidence](http://evolution.berkeley.edu/evolibrary/article/lines_02)  [Climate change: evidence from the geological record](https://www.geolsoc.org.uk/climaterecord)  [Evidence for distinct modes of solar activity](http://www.aanda.org/articles/aa/abs/2014/02/aa23391-14/aa23391-14.html)  [Google search pages: "Interpreting Scientific evidence"](https://www.google.com/webhp?sourceid=chrome-instant&rlz=1C1OPRA_enUS705US705&ion=1&espv=2&ie=UTF-8#q=%22Interpreting+Scientific+evidence%22&*)  [Introduction to Forensics](http://nd-rc.org/Forensics/Day1.htm)  [The Theory of Interpreting Scientific Transfer Evidence, by Richard S. Frank, Stanley P. Sobol](https://link.springer.com/chapter/10.1007/978-3-642-75186-8_5)  [20 tips for interpreting scientific claims, by Judith Curry](https://judithcurry.com/2013/11/20/20-tips-for-interpreting-scientific-claims/)  [Interpreting Evidence](http://homepages.mcs.vuw.ac.nz/~vignaux/evidence/interpreting.html)  [Astrophysicist: “A vibrant scientific culture encourages many interpretations of evidence”](http://www.uncommondescent.com/philosophy/astrophysicist-a-vibrant-scientific-culture-encourages-many-interpretations-of-evidence/)  [Articles on Astrophysics](https://www.google.com/webhp?sourceid=chrome-instant&rlz=1C1OPRA_enUS705US705&ion=1&espv=2&ie=UTF-8#q=Irrational+interpretations+of+evidence+in+astrophysics&*)  [Boundless: “The Fossil Record as Evidence for Evolution.”](https://www.boundless.com/biology/textbooks/boundless-biology-textbook/evolution-and-the-origin-of-species-18/evidence-of-evolution-129/the-fossil-record-as-evidence-for-evolution-521-13099/)  [Video and text: Using Fossil Evidence to Evaluate Changes in Environment & Life Conditions](http://study.com/academy/lesson/using-fossil-evidence-to-evaluate-changes-in-environment-life-conditions.html)  [Video Global Warming - Evaluating the Evidence | Chemistry for All | The Fuse School](https://www.youtube.com/watch?v=A5ir8AjmRWQ)  [Video and text New evidence found on how solar winds blow, by Tarek Bazley](http://www.aljazeera.com/news/americas/2014/10/new-evidence-found-how-solar-winds-blow-2014102412575114954.html)  **If you want to go to chapter 22 of this e-book, left click on the following link:**  [**www.TechForText.com/DP/chapter-22**](http://www.TechForText.com/DP/chapter-22) |