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| ***Techniques for Documenting with Proof or Supporting Evidence, and Related Strategies for Problem Solving***  **By David Alderoty © 2016**  **Chapter 10) Technique-10, Reasoning Based on Educated Common Sense, and Common Knowledge, WITHIN A SPECIALIZED FIELD**  [**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 1,350 words**  **If you want to go to chapter 8, left click on the following link:**  [**www.TechForText.com/DP/chapter-9**](http://www.TechForText.com/DP/chapter-9)  [**www.TechForText.com/DP/chapter-9/word.docx**](http://www.TechForText.com/DP/chapter-9/word.docx)  **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-10, Reasoning Based on Educated Common Sense, and Common Knowledge, WITHIN A SPECIALIZED FIELD 3](#_Toc466500295)  [**Subtopic, a More Precise Description of Technique-10** 4](#_Toc466500296)  [**Subtopic, the Limitations of Technique-10** 5](#_Toc466500297)  [Topic 2.) Examples, in the form of Questions that Require: Reasoning Based on Educated Common Sense, and Common Knowledge WITHIN A SPECIALIZED FIELD 7](#_Toc466500298)  [**Subtopic, The Answers to the Questions, And How they were Calculated** 7](#_Toc466500299)  [**Subtopic, Two Important Components of Techniques 9 and 10** 7](#_Toc466500300)  [**Web-Based Articles for Additional and Supporting Information for the Material Presented in this Chapter** 7](#_Toc466500301)  [**Web-Based Videos for Additional and Supporting Information for the Material Presented in this Chapter** 7](#_Toc466500302)  **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 14 minutes, and 50 seconds).***](P1.mp3) |

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| **Topic 1.) Technique-10, Reasoning Based on Educated Common Sense, and Common Knowledge, WITHIN A SPECIALIZED FIELD**  |||  Note, the term **specialized field** is used in a very general way in this e-book, and it includes any academic discipline, or trade, such as history professor, physicist, chemist, physician, plumber, carpenter, electrician, etc. All of the above professions, trades, and related fields, have their own unique set of commonly shared knowledge, vocabulary, specialized ways of reasoning, equipment, tools, strategies, and methods. This can be important for nonfiction writers if they are writing for a specific field, profession, or technical personnel. Specifically, this involves using whatever will be relevant or appropriate for your readers. For example, if you are writing for mathematicians or advanced math students, you should use the common knowledge, vocabulary, and reasoning strategies in your document that relate to mathematics.  The ideas presented in the previous two paragraphs relate to technique 10, which is reasoning based on educated common sense, and common knowledge, within a specialized field. However, when you are writing for a general audience, you have to use a different set of common knowledge, vocabulary and commonly used reasoning strategies. This relates to technique-9, which is reasoning based on common sense and common knowledge. Technique-9 was discussed in the previous chapter.  **Subtopic, a More Precise Description of Technique-10**  |||  Technique-10 is **reasoning based on educated common sense, and common knowledge, within a specialized field.** This technique is similar to **common sense reasoning**, and **common knowledge**, **with the following two major exceptions:**  1) Technique-10 includes specialized knowledge and skills obtained by most people who are educated in a specific **discipline**, **field**, or **trade**.  2) The reasoning process with technique 10, involves the **commonly used** strategies, methods, and equipment that are used to solve problems, and obtain goals in the specific **discipline**, **field**, or **trade**.  Technique 10 is essentiallyconventional commonsense reasoning techniques, combined with specialized knowledge, methods, and equipment that are typically used in a specialized field.  **Subtopic, the Limitations of Technique-10**  |||  Technique 10, typically will involve material that most readers are likely to be unfamiliar with, even if they are highly educated. This can involve specialized vocabulary, mathematics, theories, methods, and descriptions of specialized equipment. Thus, technique 10 is **not** suitable if you are writing for a general audience, even if they are highly educated. **Technique-10 is useful to support your writing, only when you are knowledgeable in a subject, and you are writing for readers that have similar knowledge.** This will become apparent after you read the next topic. |

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| **Topic 2.) Examples, in the form of Questions that Require: Reasoning Based on Educated Common Sense, and Common Knowledge WITHIN A SPECIALIZED FIELD**  |||  There are three questions presented below this paragraph that serve to illustrate technique 10, (**reasoning based on educated common sense, and common knowledge within a specialized field).** The field I used for the examples is mathematics. Thus, you will probably be able to calculate the answers to the questions **easily**, if you are well trained in mathematics. If this is not the case, you may not fully understand the questions, and you may find the calculations difficult. However, the answers to the questions and related calculations are shown in the next subtopic.  **Question 1.)** Let us assume there is a very large piece of paper 0.002 centimeters thick, and it is folded in half 78 times. This obviously results in a very thick stack of paper. How many years would it take a beam of light to transverse the thickness of the stack of paper. Calculate the result to the second decimal place. Keep in mind that light travels 186,282 miles a second, and in one year, it travels 946,073,077,711,956,000 centimeters.  Note, the above problem is only theoretical, and usually it is not possible to fold a piece of paper in half more than seven times. This problem can also be confusing if you are not familiar with geometric progressions. If this is the case, see the following websites:  [How Folding Paper Can Get You to the Moon TED-Ed](https://www.youtube.com/watch?v=AmFMJC45f1Q)  [The Geometric Progression of Folding Paper](http://www.tinyheroes.com/forums/GemStone%20IV/Socializing/Topic%20of%20the%20Day/thread/835605)  [What’s Malcolm Gladwell Talking About? by David Post](http://volokh.com/2011/05/16/whats-malcolm-gladwell-talking-about/)  Question 2.) Let us assume a ball bearing is placed in 300 cm³ of water, and the total volume increases to 304 cm³. Calculate the length of the radius of the ball bearing to six decimal places, in centimeters.  Question 3.) Ten marbles of identical size are placed in 200 cm³ of water, and the total volume of the water increases to 242 cm³. What is the total surface area of the 10 marbles in square centimeters, calculated to the second decimal place?  **Subtopic, The Answers to the Questions, And How they were Calculated**  |||  The questions above are repeated in this section, with the answers, and related calculations.  Question 1.) Let us assume there is a very large piece of paper 0.002 centimeters thick, and it is folded in half 78 times. This obviously results in a very thick stack of paper. How many years would it take a beam of light to transverse the thickness of the stack of paper. Calculate the result to the second decimal place. Keep in mind that light travels 186,282 miles a second, and in one year, it travels 946,073,077,711,956,000 centimeters. **The answer to this question is 638.92 years, and it can be calculated as follows:**  In the above equation, the long number (the divisor) is the distance that light travels in one year in centimeters.  You can obtain the above answer with Microsoft Excel, by using this formula: **=((2^78)\*(0.002))/946073077711956000** You can copy and paste this formula into a Microsoft Excel worksheet. Before pasting, left click on the cell you want to use for the calculation.  **Question 2.)** Let us assume a ball bearing is placed in 300 cm³ of water, and the total volume increases to 304 cm³. Calculate the length of the radius of the ball bearing to six decimal places, in centimeters. **The answer to this question is 0.984745 centimeters, and it can be calculated as follows:**  **𝑉=**  The above number is the length of the radius, before it was rounded down to six decimal places. This calculation result can be obtain with Microsoft Excel, by using this formula: **=((3\*4)/(4\*PI()))^(1/3)** You can copy and paste this formula into a Microsoft Excel worksheet. Before pasting, left click on the cell you want to use for the calculation.  The calculated result, presented above, can be checked by calculating the volume of a sphere, using 0.9847450218426970 for the length of the radius. If the calculation is correct the result will be **4** cm3 **This can easily be done with an online calculation device I created a few years ago, which can be accessed from:** [**www.TechForText.com/Sphere/Calculator**](http://www.TechForText.com/Sphere/Calculator)  **Question 3.)** Ten marbles of identical size are placed in 200 cm³ of water, and the total volume of the water increases to 242 cm³. What is the total surface area of the 10 marbles in square centimeters, calculated to the second decimal place? **The answer to this question is 125.89 square centimeters, and it was calculated as follows:**  Solve for the radius, in the formula for the volume of a sphere, which is presented below: The radius is designated with the letter **r**  **𝑉=**  The formula below is for the length of the radius of a sphere, based on the sphere’s volume.  The formula for the **surface area** of a sphere is presented below:  Create a new formula, by substituting the formula for the radius of the sphere, into the formula for the surface area of a sphere. This results in a formula for calculating the surface area of a sphere, as shown below:  The volume of 10 marbles is 242 cm³-200 cm³ = **42 cm³** Thus, the volume of one marble is 4.2 cm3, and it is substituted into the following equation for **V**, as shown below:  The formula presented above is for calculating the surface area of one marble. However, the question asks for the surface area of 10 marbles. Thus, the formula is multiplied by 10, below.  You can obtain the above answer with Microsoft Excel, by using this formula: **=40\*PI()\*(12.6/(4\*PI()))^(2/3)** You can copy and paste this formula into a Microsoft Excel worksheet. Before pasting, left click on the cell you want to use for the calculation.  **Subtopic, Two Important Components of Techniques 9 and 10**  |||  There are two important components of techniques 9 and 10, which are, common knowledge, and Common Knowledge, WITHIN A SPECIALIZED FIELD. These concepts are very important for nonfiction writers, because when information falls into either of the above, it is usually not necessary to use citations, unless you are quoting a paraphrasing. When dealing with information that does not fall into the above categories, it is necessary to credit the author, even if you are not using paraphrases or quotes. This is explained in more detail in the next chapter.  **Web-Based Articles for Additional and Supporting Information for the Material Presented in this Chapter**  |||  [Writing for a Professional Audience (and Like a Pro)](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file) **[“](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file)**[The audience of a technical report--or any piece of writing for that matter--is the intended or potential reader or readers. For most technical writers, this is](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file)*[the most important](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file)*[consideration in planning, writing, and reviewing a document. You "adapt" your writing to meet the needs, interests, and background of the readers who will be reading your writing.](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file)**[”](http://philosophy.rutgers.edu/docman-lister/adobe-pdf-documents/277-writing-for-a-professional-audience-and-like-a-pro-pdf/file)**  [Professional and Technical Writing/Rhetoric/Audiences](https://en.wikibooks.org/wiki/Professional_and_Technical_Writing/Rhetoric/Audiences)  [Consider Your Audience, Ensure that your documents meet the needs and expectations of your readers](http://writingcommons.org/open-text/writing-processes/think-rhetorically/712-consider-your-audience)  [Audience Analysis: Power Tools for Technical Writing, By Ivan Walsh](http://www.ihearttechnicalwriting.com/audience-analysis-power-tools-for-technical-writing/)  [Professional, Technical Writing, Purdue OWL](https://owl.english.purdue.edu/owl/section/4/16/)  [Audience Analysis Overview, Purdue OWL](https://owl.english.purdue.edu/owl/resource/629/1/)  [Geometric Sequences and Sums](http://www.mathsisfun.com/algebra/sequences-sums-geometric.html)  [Geometric Sequences and Series](http://www.regentsprep.org/regents/math/algtrig/atp2/geoseq.htm)  [Geometric Sequence Calculator](https://www.symbolab.com/solver/geometric-sequence-calculator)  **Web-Based Videos for Additional and Supporting Information for the Material Presented in this Chapter**  |||  [Professional Technical Writing: Advance Your Writing Skills](https://www.udemy.com/technical-writing-and-editing/)  [Grammatical & Contextual Correctness in Technical Communication](http://study.com/academy/lesson/grammatical-contextual-correctness-in-technical-communication.html)  [The mathematics of folding a piece of paper](https://www.youtube.com/watch?v=B_rM_c4kn1A)  [How folding paper can get you to the moon - Adrian Paenza](http://ed.ted.com/lessons/how-folding-paper-can-get-you-to-the-moon)  **If you want to go to chapter 11 of this e-book, left click on the following link:**    [**www.TechForText.com/DP/chapter-11**](http://www.TechForText.com/DP/chapter-11) |