

HOW TO READ TECHNICAL MATERIAL

Scientific and mathematical texts pose a unique reading challenge. Not only must the reader derive meaning based on prior knowledge and the words on the page, but reading technical material also requires heightened visualization. This resource will provide strategies for reading technical material.

Sampeio de Alencar & Tavares de Alencar (2017) explain that extra time and energy are needed to read technical material (p. 77). Therefore, make sure to prepare your body and mind for the task by allowing plenty of time for the work, fueling yourself with healthy food, and getting enough sleep.

STEPS OF THE PROCESS

1. **Overview** – Look at one of your assigned chapters. Do not simply start at the beginning and try to read all the way through the chapter. Instead:
 - a. **Scan** the introduction and conclusion of the sections.
 - b. **Skim** through the pages, looking at section headings, topics, graphs, tables, and organization.
 - c. **Determine** the chapter's main topic and the structure the author will use to explain it (Sampeio de Alencar & Tavares de Alencar, 2017, p. 78).
2. **Read** – Next, decide which sections within the chapter matter most towards understanding the main topic of the chapter.
 - a. **Read** the prioritized sections with an eye open for key terms and new vocabulary.
 - b. **Look** for the difference between fact, theory, and opinion within the text. If the author is presenting their educated opinion, consider how they reached their conclusions (Sampeio de Alencar & Tavares de Alencar, 2017, p. 79).
3. **Practice** – Your textbook may separate sections with several practice problems.
 - a. **Attempt** a few of the practice problems after each section, and then continue reading.
 - b. Additionally, the chapter will probably end with a comprehensive list of practice problems. Take time to **complete** as many problems without assistance as you can. For technical work, practice does make perfect.
4. **Evaluate** – Once you have finished reading through the prioritized sections and feel you have a strong grasp on the chapter's meaning, consider how your prior knowledge on the topic relates to what you have just read.
 - a. **Consider** whether your prior knowledge matches this new information. Do you find the author's argument to be stable and valid?

- b. Sampeio de Alencar and Tavares de Alencar (2017) point to this stage as the time to **evaluate** the “merit and accuracy” of the author’s position (p. 79). **Support** your ideas with facts outside your own opinion.
5. **Compare** – The last stage of your reading process should be to compare the text with other current publications on the topic (Sampeio de Alencar & Tavares de Alencar, 2017, p. 79).
 - a. How does this author’s evidence and conclusions compare with other authors’ writing on the issue? Often, this stage of the reading process occurs when you **write** an essay or **engage** in class discussion.

STRATEGIES TO APPLY WHILE READING

1. **Make special note of the primary nouns and verbs in the text** – When you read, make a list of the main nouns and actions (Hain, 1994). Your comprehension of them will better equip you to understand the entirety of the text.
2. **Keep track of new terms and challenging vocabulary** – Technical material contains distinct vocabulary. Take note of new words and research their definitions. Then, determine how each word operates in the context of the passage (Huffman-Kelley, 2015, p. 12).
3. **Spend time studying provided charts and graphs** – Because technical material requires heightened visualization, take time to study the charts, graphs, and other illustrations provided in your textbook (Huffman-Kelley, 2015, p. 10). These will help you construct a tangible picture from abstract ideas.
4. **Take an extra moment to visualize a word problem or formula in action when a chart or graph is not provided** – If there is no illustration provided, then take time to visualize the formula or word problem. Perhaps this looks like drawing a graph or chart yourself (Massey & Riley, 2013, p. 580).
5. **Pause occasionally to ask yourself “Why?”** – If you stop long enough to ask yourself why a certain mathematical formula works the way it does, or why a biological function works the way it does, you will engage in problem solving while reading (Smith et al., 2010, pp. 365, 376). You will also engage your prior knowledge. Both of these types of engagement will enhance your comprehension.

PRACTICE NOW

References

- Hain, B. (1994). Training tutors to read technical writing. *Writing Lab Newsletter* 18(9), 15.
<https://www.wlnjournal.org/archives/v18/18-9.pdf>.
- Huffman-Kelley, K., Perin, D., & Liu, X. (2015). Integrating reading skills in an introductory science classroom. *Journal of College Science Teaching* 44(5), 10-15.
<https://ezproxy.regent.edu/login?url=https://www.proquest.com/scholarly-journals/integrating-reading-skills-introductory-science/docview/1683317585/se-2?accountid=13479>.
- Massey, D. & Riley, L. (2013). Reading math textbooks: An algebra teacher's patterns of thinking. *Journal of Adolescent & Adult Literacy* 56(7), 577-586. <https://www.jstor.org/stable/41827902>.
- Sampeio de Alencar, M., & Tavares de Alencar, T. (2017). *Scientific style in English*. River Publishers.
- Smith, B. L., Holliday, W. G., & Austin, H. W. (2010). Students' comprehension of science textbooks using a question-based reading strategy. *Journal of Research in Science Teaching* 47(4), 363-379.
<https://doi-org.ezproxy.regent.edu/10.1002/tea.20378>.