



The Thinker's Guide

For Students

On

How to Study & Learn

a discipline

using critical thinking concepts & tools

By Richard Paul and Linda Elder

This is a companion to

“The Miniature Guide to Critical Thinking” by Paul & Elder

Why a Thinker's Guide on How to Study and Learn?

This guide is designed not only for students but also for administrators and faculty, to remind us all of the essence of what it is to study academic subjects with discipline. It does not aim to take the intellectual work out of learning—for this would be an insult to the intelligence of our readers. It contributes, rather, toward making intellectual work and deep learning more manageable, practical, and intuitive. Its goal is to foster lifelong learning and the traditional ideal of a liberally educated mind: a mind that questions, probes, and masters a variety of forms of knowledge, through command of itself, intellectual perseverance, and the tools of learning. It respects equally the traditions of John Henry Newman, Bertrand Russell, and Albert Einstein.

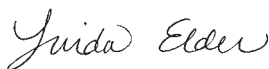
It does not answer all questions, but rather puts all questions into a clear perspective. It emphasizes that all bona fide fields of study share common intellectual structures and standards of reasonability. It emphasizes that foundational intellectual structures and standards of reasonability are worth learning explicitly and in themselves, since they help us more deeply interconnect and understand all that we learn. It also emphasizes foundational intellectual dispositions and values that define the traits of the disciplined thinker in all fields: intellectual autonomy, intellectual humility, intellectual integrity, intellectual perseverance, intellectual empathy, confidence in reason, and fair-mindedness. On every page, it honors the idea and power of intellectual work.

It scorns the idea of knowledge as the memorizing of bits and pieces of information, or as the mere accumulation of so many units or institutional credits. It rejects both dogmatic absolutism and intellectual relativism. It warns us of the danger of ignorance and misconception, and by implication, that of self-deception and illusion in human affairs. It emphasizes the importance of contrasting disciplines whose questions are, by and large, answerable in definitive ways, with those whose questions require multiple perspectives, role-playing, and reasoned judgment. It distinguishes, in short, one-system subjects like physics, chemistry, and math (where disagreement between experts plays a minor role) from competing-systems subjects like history, psychology, and art (where expert disagreement plays a major role).

If this thinker's guide is successful, it will serve as a resource to which one can return again and again to garner new depth of meaning and understanding. What is worth learning is worth learning well, and there is nothing better worth learning than the very process of learning itself: the development, through systematic intellectual work of the arts, habits, and strategies, of a DISCIPLINED mind.



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How to Use This Guide

In this guide we suggest a variety of strategies for becoming not just a better student but a master student. Some are simple. Others require further explanation and clarification. For example, if you are motivated to improve, you can immediately implement Idea #15 (from "**18 Ideas for Becoming a Master Student**"): "Test yourself before you come to class by trying to summarize, orally or in writing, the main points of the previous class meeting." Your summary may be inaccurate, but you will learn from the attempt.

On the other hand, some of the suggestions may require further understanding on your part. Consider Idea #4: "Become a questioner. Engage yourself in lectures and discussions by asking questions. If you don't ask questions, you will probably not discover what you do and do not know." In this case you may need to read further in the guide to get ideas of kinds of questions you can and should ask.

We suggest, therefore, that you employ a two-fold process. First, using **18 Ideas For Becoming A Master Student**, compile a personal list of suggestions or strategies you can immediately use. **USE THEM IMMEDIATELY.** Second, read through the remaining pages one by one looking for further strategies, especially as you acquire insight into items on the initial list of 18 ideas.

For example, you may want to ask more questions in class, but are not sure what to ask. Then, you read about eight basic structures in thinking: purpose, question, information, interpretation, concept, assumption, implication, and point of view. Each of the structures suggests to you possible questions. You then begin to pose some of them in class (Do chemists assume that...?).

Of course, this presupposes that you summon up the courage to raise your hand in class and actually ask questions (questions which your classmates may think odd). For example, you might raise your hand and say, "I was a little confused by chapter III in our text. What is the main idea of the chapter, as you see it?" If you just sit there afraid of what the other students might think, you will probably not ask any questions at all.

Finally, as you successfully implement some of the suggestions, your confidence and motivation should improve. Re-cycling through the guide, again and again, re-thinking what you are and are not doing, should raise you to yet further achievements as a student—a student seeking mastery.

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18 Ideas for Becoming a Master Student

- Idea #1:** Make sure you thoroughly understand the requirements of each class, how it will be taught, and what will be expected of you. Ask questions about the grading policies and for advice on how best to prepare for class.
- Idea #2:** Become an active learner. Be prepared to work ideas into your thinking by active reading, writing, speaking, and listening.
- Idea #3:** Think of each subject you study as a form of thinking. (If you are in a history class, your goal should be to think historically; in a chemistry class to think chemically; etc.)
- Idea #4:** Become a questioner. Engage yourself in lectures and discussions by asking questions. If you don't ask questions, you will probably not discover what you do and do not know.
- Idea #5:** Look for interconnections. The content in every class is always a SYSTEM of interconnected ideas, never a random list of things to memorize. Don't memorize like a parrot. Study like a detective, always relating new learning to previous learning.
- Idea #6:** Think of your instructor as your coach. Think of yourself as a team member trying to practice the thinking exemplified by your instructor. For example, in an algebra class, think of yourself as going out for the algebra team and your teacher as demonstrating how to prepare for the games (tests).
- Idea #7:** Think about the textbook as the thinking of the author. Your job is to think the thinking of the author. For example, role play the author frequently. Explain the main points of the text to another student, as if you were the author.
- Idea #8:** Consider class time as a time in which you PRACTICE thinking (within the subject) using the fundamental concepts and principles of the course. Don't sit back passively, waiting for knowledge to fall into your head like rain into a rain barrel. It won't.

- Idea #9:** Relate content whenever possible to issues and problems and practical situations in your life. If you can't connect it to life, you don't know it.
- Idea #10:** Figure out what study and learning skills you are not good at. Practice those skills whenever possible. Recognizing and correcting your weaknesses is a strength.
- Idea #11:** Frequently ask yourself: "Can I explain this to someone not in class?" (If not, then you haven't learned it well enough.)
- Idea #12:** Seek to find the key concept of the course during the first couple of class meetings. For example, in a biology course, try explaining what biology is in your own words. Then relate that definition to each segment of what you learn afterward. Fundamental ideas are the basis for all others.
- Idea #13:** Routinely ask questions to fill in the missing pieces in your learning. Can you elaborate further on this? Can you give an example of that? If you don't have examples, you are not connecting what you are learning to your life.
- Idea #14:** Test yourself before you come to class by trying to summarize, orally or in writing, the main points of the previous class meeting. If you cannot summarize main points, you haven't learned them.
- Idea #15:** Learn to test your thinking using intellectual standards. "Am I being clear? Accurate? Precise? Relevant? Logical? Am I looking for what is most significant?"
- Idea #16:** Use writing as a way to learn by writing summaries in your own words of important points from the textbook or other reading material. Make up test questions. Write out answers to your own questions.
- Idea #17:** Frequently evaluate your listening. Are you actively listening for main points? Can you summarize what your instructor is saying in your own words? Can you elaborate what is meant by key terms?
- Idea #18:** Frequently evaluate your reading. Are you reading the text book actively? Are you asking questions as you read? Can you distinguish what you understand from what you don't?

How to Figure Out the Form of Thinking Essential to Courses or Subjects

Consider the following thinking on the part of a student taking a course in history:

"To do well in this course, I must begin to think historically. I must not read the textbook as a bunch of disconnected stuff to remember but as the thinking of the historian. I must myself begin to think like a historian. I must begin to be clear about historical purposes (What are historians trying to accomplish?). I must begin to ask historical questions (and recognize the historical questions being asked in the lectures and textbook). I must begin to sift through historical information, drawing some historical conclusions. I must begin to question where historical information comes from. I must notice the historical interpretations that the historian forms to give meaning to historical information. I must question those interpretations (at least sufficiently to understand them). I must begin to question the implications of various historical interpretations and begin to see how historians reason to their conclusions. I must begin to look at the world as historians do, to develop a historical viewpoint. I will read each chapter in the textbook looking explicitly for the elements of thought in that chapter. I will actively ask (historical) questions in class from the critical thinking perspective. I will begin to pay attention to my own historical thinking in my everyday life. I will try, in short, to make historical thinking a more explicit and prominent part of my thinking."

Students who approach history classes as historical thinking begin to understand the historical dimension of other subjects as well. For example, they begin to recognize that every subject itself has a history and that the present state of the subject is a product of its historical evolution. What is more, such historically-thinking students also notice the overlap between history as a study of the relatively recent past of humans (the last 30,000 years) and the much longer history of humans (canvassed in anthropology). They are able to place these last 30,000 years (which seem a long time when we first think of it) into the larger historical perspective of anthropology which begins its study of the human past some 2,000,000 years ago when

our ancestors were small, hairy, apelike creatures who used tools such as digging sticks and clubs, walked upright, carried their tools, and lived on plant food. What is more, they see this longer history breaking down into stages: from hunting and gathering civilizations to agricultural civilizations to industrial civilizations to post-industrial civilizations.

And that is not all. They are then able to take this historical perspective and put it into a yet larger historical view by shifting from anthropological thinking to geographical thinking. They grasp that human history is itself a small part of a much older history, that of mammals, and that the age of mammals was preceded by an age of reptiles, and that by the age of coal-plants, and that by the age of fish, and that by the age of mollusks. They then can take the next step and grasp that geological history, even though reaching back thousands of millions of years is comparatively short when compared to that of the solar system, while that of the solar system is comparatively short when compared to the galaxy, while that of the galaxy is comparatively short when compared to the universe itself.

Students' capacity to think historically in larger and larger time spans continues to develop as their study of all subjects is transformed by a developing sense of the drama of time itself. They are then able to shift from history to pre-history, from pre-history to anthropological history, from anthropological history to geological history, and from geological history to astronomical history. In this ever-expanding perspective, the history of human knowledge is pitifully short: a milli-second geologically, a milli-milli second astronomically. It is only a second ago—astronomically speaking—that a species has emerged, *Homo sapiens*, which drives itself, and creates the conditions to which it itself must then adapt in new and unpredictable ways. It is only a milli-second ago that we have developed the capacity, though not the propensity, to think critically.

Essential Idea: It is possible to think deeply within a subject and see applications of that thinking in related subjects. Doing so increases the power of thinking and learning.

How to Learn Ideas from Textbooks

- All textbooks are organized by systems of ideas within them. Diagram the systems to help you begin to learn them. Notice yourself naming, identifying, connecting, distinguishing, and explaining things using ideas.
- Where we have knowledge, we have an organized technical vocabulary. Create a glossary of the most important ideas you learn in each subject you study.
- Your knowledge can be no stronger than the knowledge you have of ideas in a subject. Test yourself by trying to explain key ideas in non-technical language.
- All ideas must be understood in relation to contrasting ideas. Try naming and explaining the ideas opposite to key ideas you learn.
- All idea clusters must be understood as part of further such clusters. Take any important idea you learn and name the ideas that cluster around it.
- There are many domains of ideas: ethical, religious, cultural social, political, scientific, mathematical, etc. Name and explain a key idea in each domain.
- At the beginning of each semester, try making a list of at least 25 ideas you want to learn in each subject. To do this you might read an introductory chapter from the textbook or an article on each subject from an encyclopedia. Then explain the list of ideas to a friend (state, elaborate, exemplify, and illustrate each).
- As the course proceeds, add new ideas to the list and underline those ideas you are confident you can explain. Regularly translate chapter and section titles from the textbook into ideas. In addition, look for key ideas in every lecture you hear. Relate basic ideas to the basic theory the subject uses to solve problems. Master fundamental ideas and theories well. Do not move on until you do.

Essential Idea: One important way to think about what you are learning is by highlighting, diagramming, and explaining the ideas at the heart of each subject you study.

How to Raise Important Questions Within a Subject

Every discipline is best known by the questions it generates and the way it goes about settling those questions. To think well within a discipline, you must be able to raise and answer important questions within it. At the beginning of a semester of study, try generating a list of at least 25 questions that each discipline you are studying seeks to answer. To do this you might read an introductory chapter from the textbook or an article on the discipline from an encyclopedia. Then explain the significance of the questions to another person.

Then add new questions to the list (as your courses proceed) underlining those questions when you are confident you can explain how to go about answering them. Regularly translate chapter and section titles from your textbooks into questions. For example, a section on photosynthesis answers the question, What is photosynthesis?

In addition, look for key questions in every lecture you hear. Relate basic questions to the basic theory the discipline uses to solve problems. Master fundamental questions well. Do not move on until you understand them.

Notice the interrelationship between key ideas and key questions. Without the ideas the questions are meaningless. Without the questions, the ideas are inert. There is nothing you can do with them. A skilled thinker is able to take questions apart, generate alternative meanings, distinguish leading from subordinate questions, and grasp the demands that questions put upon us.

Essential Idea: If you become a good questioner within a discipline, you will learn the essential content of the discipline.