



A Miniature Guide

For Students and Faculty

To

The Foundations Of

Analytic Thinking

**How To Take Thinking Apart
And What To Look For When You Do**

**The Elements of Thinking
and
The Standards They Must Meet**

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Based on *Critical Thinking Concepts & Tools*

The Foundation for Critical Thinking

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Why a Guide on Analytic Thinking?

Analysis and evaluation are recognized as *crucial skills* for all students to master. And for good reason. They are required in learning any significant body of content in a non-trivial way. Students are commonly asked to analyze poems, mathematical formulas, biological systems, chapters in textbooks, concepts and ideas, essays, novels, and articles—just to name a few. Yet what student can explain what analysis requires? What students have a clear conception of how to think it through? Which of our graduates could complete the sentence: “Whenever I am asked to analyze something, I use the following model:...”

The painful fact is that few students have been taught *how* to analyze. Hence, when they are asked to analyze something scientific, historical, literary, or mathematical—let alone something ethical, political, or personal—they lack a model to empower them in the task. They muddle through their assignment with only the vaguest sense of what analysis requires. They have no idea how sound analysis can lead the way to sound evaluation and assessment. Of course, students are not alone. Many adults are similarly confused about analysis and assessment as intellectual processes.

Yet what would we think of an auto mechanic who said, “I’ll do my best to fix your car, but frankly I’ve never understood the parts of the engine,” or of a grammarian who said, “Sorry, but I have always been confused about how to identify the parts of speech.” Clearly, students should not be asked to do analysis if they do not have a clear model, and the requisite foundations, for the doing of it. Similarly, we should not ask students to engage in assessment if they have no standards upon which to base their assessment. Subjective reaction should not be confused with objective evaluation.

To the extent that students internalize this model through practice, they put themselves in a much better position to begin to think historically (in their history classes), mathematically (in their math classes), scientifically (in their science classes), and therefore more skillfully (in all of their classes). When this model is internalized, students become better students because they acquired a powerful “system-analyzing-system.”

This miniature guide is a companion to *The Miniature Guide to Critical Thinking Concepts and Tools*. It supports, and is supported by, all of the other miniature guides in the series. It exemplifies why thinking is best understood and improved when we are able to analyze and assess it EXPLICITLY. The intellectual skills it emphasizes are the same skills needed to reason through the decisions and problems inherent in any and every dimension of human life.

All Humans Use Their Thinking To Make Sense of the World

The words *thinking* and *reasoning* are used in everyday life as virtual synonyms. Reasoning, however, has a more formal flavor. This is because it highlights the inference-drawing capacity of the mind.

Reasoning occurs whenever the mind draws conclusions on the basis of reasons. We draw conclusions whenever we make sense of things. The result is that whenever we think, we reason. Usually we are not aware of the full scope of reasoning implicit in our minds.

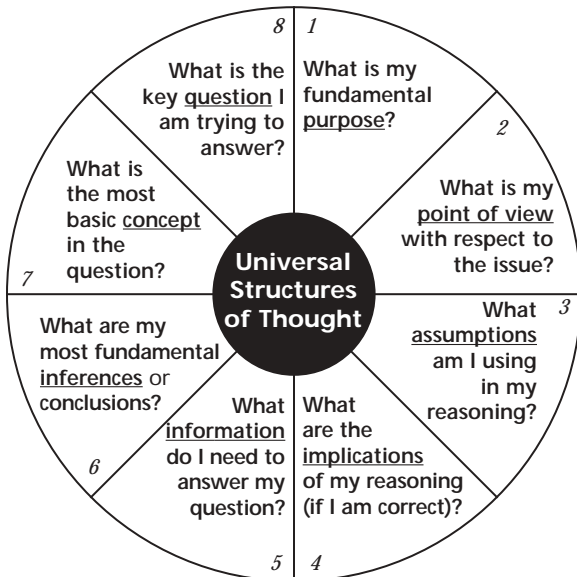
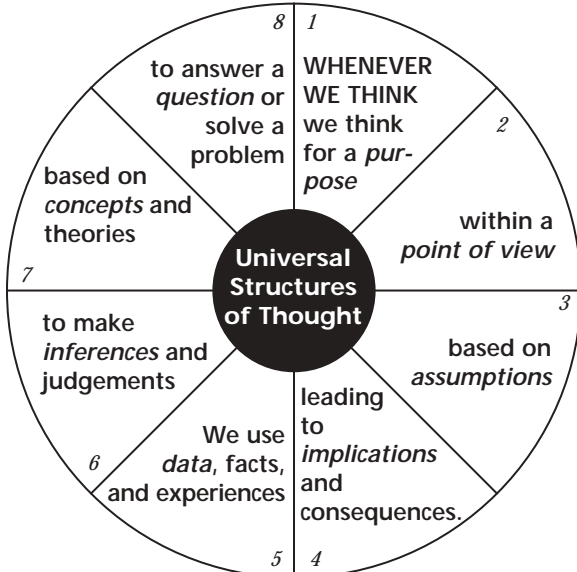
We begin to reason from the moment we wake up in the morning. We reason when we figure out what to eat for breakfast, what to wear, whether to make certain purchases, whether to go with this or that friend to lunch. We reason as we interpret the oncoming flow of traffic, when we react to the decisions of other drivers, when we speed up or slow down. One can draw conclusions, then, about everyday events or, really, about anything at all: about poems, microbes, people, numbers, historical events, social settings, psychological states, character traits, the past, the present, the future.

By reasoning, then, we mean making sense of something by giving it some meaning in our mind. Virtually all thinking is part of our sense-making activities. We hear scratching at the door and think, "It's the dog." We see dark clouds in the sky and think, "It looks like rain." Some of this activity operates at a subconscious level. For example, all of the sights and sounds about us have meaning for us without our explicitly noticing that they do. Most of our reasoning is unspectacular. Our reasoning tends to become explicit only when someone challenges it and we have to defend it ("Why do you say that Jack is obnoxious? I think he is quite funny"). Throughout life, we form goals or purposes and then figure out how to pursue them. Reasoning is what enables us to come to these decisions using ideas and meanings.

On the surface, reasoning often looks simple, as if it had no component structures. Looked at more closely, however, it implies the ability to engage in a set of interrelated intellectual processes. This miniature guide is largely focused on making these intellectual processes explicit. It will enable you to better understand what is going on beneath the surface of your thought.

Essential Idea: Reasoning occurs when we draw conclusions based on reasons. We can upgrade the quality of our reasoning when we understand the intellectual processes that underlie reasoning.

To Analyze Thinking We Must Learn to Identify and Question its Elemental Structures



Be aware: When we understand the structures of thought, we ask important questions implied by these structures.

Analyzing Problems

Identify some problem you need to reason through.

Then complete the following:

What exactly is the problem? (Study the problem to make clear the kind of problem you are dealing with. Figure out, for example, what sorts of things you are going to have to do to solve it. Distinguish problems over which you have some control from problems over which you have no control. Pay special attention to controversial issues in which it is essential to consider multiple points of view.)

The key question that emerges from the problem is... (State the question as clearly and precisely as you can. Details are very important.)

My purpose in addressing the problem is... (Know exactly what you are after. Make sure you are not operating with a hidden agenda and that your announced and real purposes are the same.)

Actively seek the information most relevant to the question. (Include in that information options for action, both short-term and long-term. Recognize limitations in terms of money, time, and power.)

Some important assumptions I am using in my thinking are... (Figure out what you are taking for granted. Watch out for self-serving or unjustified assumptions.)

If we solve this problem, some important implications are... If we fail to solve this problem, some important implications are... (Evaluate options, taking into account the advantages and disadvantages of possible decisions before acting. What consequences are likely to follow from this or that decision?)

The most important concepts, theories, or ideas I need to use in my thinking are... (Figure out all significant ideas needed to understand and solve the problem. You may need to analyze these concepts. Use a good dictionary.)

The point(s) of view is/are as follows: (Know the point of view from which your thinking begins. Be especially careful to determine whether multiple points of view are relevant.)

After reasoning through the parts of thinking above, the best solution (conclusion) to the problem is... (If the problem involves multiple conflicting points of view, you will have to assess which solution is the **best**. If the problem is one-dimensional, there may be just one "correct" solution.)

Analyzing the Logic of a Subject

When we understand the elements of reasoning, we realize that all subjects, all disciplines, have a fundamental logic defined by the structures of thought embedded in them.

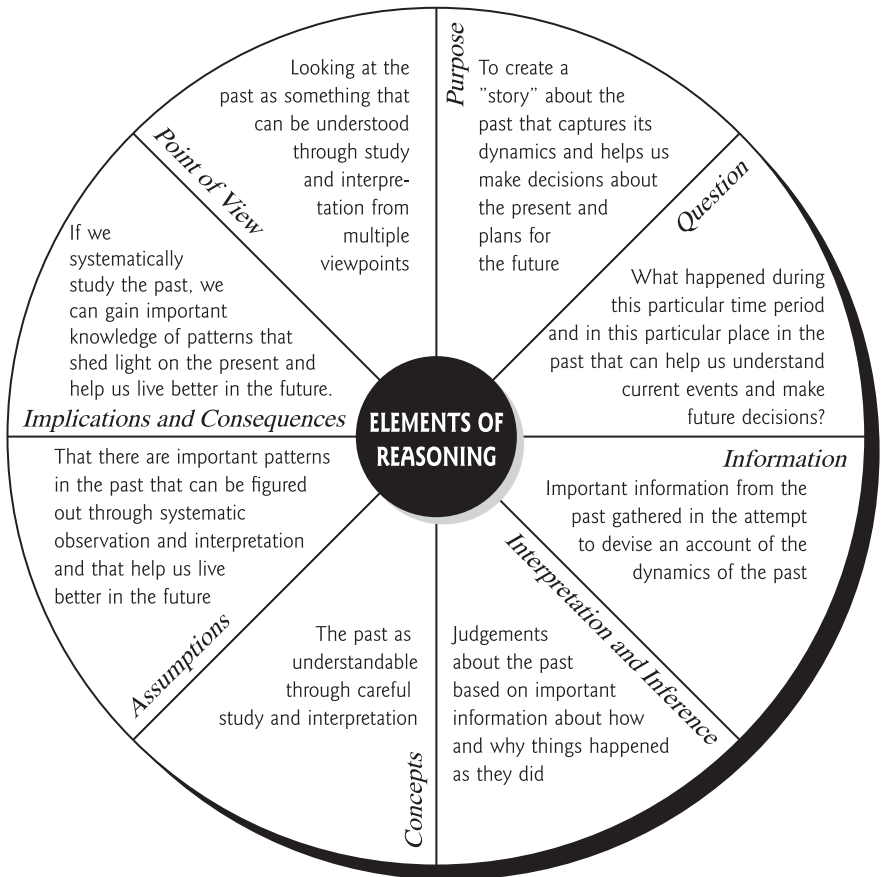
Therefore, to lay bare a subject's most fundamental logic, we should begin with these questions:

- What is the main purpose or goal of studying this subject? What are people in this field trying to accomplish?
- What kinds of questions do they ask? What kinds of problems do they try to solve?
- What sorts of information or data do they gather?
- What types of inferences or judgments do they typically make? (Judgments about...)
- How do they go about gathering information in ways that are distinctive to this field?
- What are the most basic ideas, concepts or theories in this field?
- What do professionals in this field take for granted or assume?
- How should studying this field affect my view of the world?
- What viewpoint is fostered in this field?
- What implications follow from studying this discipline? How are the products of this field used in everyday life?

These questions can be contextualized for any given class day, chapter in the textbook and dimension of study. For example, on any given day you might ask one or more of the following questions:

- What is our main purpose or goal today? What are we trying to accomplish?
- What kinds of questions are we asking? What kinds of problems are we trying to solve? How does this problem relate to everyday life?
- What sort of information or data do we need? How can we get that information?
- What is the most basic idea, concept or theory we need to understand to solve the problem we are most immediately posing?
- From what point of view should we look at this problem?
- What can we safely assume as we reason through this problem?
- Should we call into question any of the inferences that have been made?
- What are the implications of what we are studying?

The Logic of History



Be aware: Much human thinking is "historical." We use our beliefs (formed in the past) to make thousands of decisions in the present and plans for the future. Much of this historical thinking is deeply flawed.