

The Thinker's Guide
to

Intellectual Standards:

The Words That Name Them
And the Criteria That Define Them

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The Foundation for Critical Thinking

Introduction

Man, n. *An animal so lost in rapturous contemplation of what he thinks he is as to overlook what he indubitably ought to be.*

Ambrose Bierce, *The Devil's Dictionary*, 1906

[Critical thinking is] ... the examination and test of propositions of any kind which are offered for acceptance, in order to find out whether they correspond to reality or not. The critical faculty is a product of education and training. It is a mental habit and power. It is a prime condition of human welfare that men and women should be trained in it. It is our only guarantee against delusion, deception, superstition, and misapprehension of ourselves and our earthly circumstances.

William Graham Sumner, 1906

Humans live in a world of thoughts. We accept some thoughts as true. We reject others as false. But the thoughts we perceive as true are sometimes false, unsound, or misleading. And the thoughts we perceive as false and trivial are sometimes true and significant.

The mind doesn't naturally grasp the truth. *We don't naturally see things as they are.* We don't automatically sense what is reasonable and what unreasonable. Our thought is often biased by our agendas, interests, and values. *We typically see things as we want to.* We twist reality to fit our preconceived ideas. Distorting reality is common in human life. It is a phenomenon to which we all unfortunately fall prey.

Each of us views the world through multiple lenses, often shifting them to fit our changing feelings. In addition, much of our perspective is unconscious and uncritical and has been influenced by many forces – including social, political, economic, biological, psychological, and religious influences. Social rules and taboos, religious and political ideologies, biological and psychological impulses, all play a role, often unconscious, in human thinking. Selfishness, vested interest and parochialism, are deeply influential in the intellectual and emotional lives of most people.

We need a system for intellectual intervention, a method for pre-empting bad thinking. We need to take rational command of our cognitive processes in order to rationally determine what to accept and what to reject. In short, we need *standards for thought*, standards that guide us to consistently excellent thinking – standards we can count on to keep our thinking on track, to help us mirror in our minds what is happening in reality, to reveal the truth in situations, to enable us to determine how best to live our lives.

As it happens, all modern natural languages¹ provide their users with a wide range of intellectual standard words, terms which, when appropriately used, serve as plausible guides for assessing reasoning. For example, the following words name intellectual standards in the English Language: 'clarity,' 'accuracy,' 'precision,' 'relevance,' 'depth,' 'breadth,' 'logicalness,' 'significance' and 'fairness'.² There are synonyms for them, we suggest, in every natural language (German, French, Spanish, Korean, Chinese, Turkish, and so on). The same words in French, for instance, are 'clarté,' 'exactitude,' 'précision,' 'pertinence,' 'profondeur,' 'ampleur,' 'logique,' 'signification,' 'impartialité,' and in German are: 'klarheit,' 'richtigkeit,' 'exaktheit,' 'relevanz,' 'tiefgang,' 'vernetzung,' 'logik,' 'fokussierung,' 'fairness.'

Understanding how to apply intellectual standard words appropriately to cases is essential to thinking well in every language.

In other words, to live reasonably, humans need to construct their thinking so as to be *clear, accurate, relevant, significant, logical* and so forth. They also need to *clarify* the thinking of others, to check for accuracy, logic, significance and so on. Routine use of these nine intellectual standards is essential to thinking well within every domain of human life. And these standards are part of a much broader set of intellectual standards humans need to draw upon regularly as part of their everyday life.

Our goal in this guide is to provide a conscious foundation for thinking about intellectual standards, and the words that name them. Ultimately, such consciousness will enable those proficient in the use of intellectual standard words to think more effectively in every domain and subject in which, or about which, they think. Of course, in this brief space, we can provide merely the *beginnings* of a systematic analysis of standards for thought. In doing so, we open the door to the development of a broad and integrated view of intellectual standards.

Our fundamental objective is to illuminate the importance of explicitly mastering intellectual standards, and the words that name them, with a view to improving our thinking across the multiple domains of our lives. Otherwise the quality of our thinking, and our actions, is left to chance, intuition, or some other automatic mode of functioning.

¹ Natural languages are languages used in the conduct of daily life (languages such as English, German, French, Arabic, Japanese). They are used in ordinary communication by those who share the language. Natural languages emerge from repositories of terms and phrases that have developed over thousands of years by people who share a region and who communicate with one another. Natural languages contrast with artificial languages, which are created by specialties to facilitate a domain of study or interest (such as science, psychology, mathematics, baseball, the various technologies ...). Of course, artificial languages share some terms with natural languages, but should not be confused with natural languages. Any conflict between natural and specialized languages must be settled case by case.

² These nine standards have been at the center of the work of Paul and Elder during the past decade or more. In this guide, we go beyond these nine to a general exploration of the logic of intellectual standards.

In conceptualizing intellectual standards, we hypothesize the following:

1. that intellectual standard terms are rooted in the language we use every day and are presupposed in every subject, discipline and domain of human thought.³
2. that there is a rich variety of intellectual standard terms extant in natural languages from which we can draw to discipline our thinking.⁴
3. that intellectual standards form constellations of interrelated meanings that can be placed into categories with heads such as 'clarity,' 'accuracy,' 'precision,' 'relevance,' 'importance,' and 'fairness.'
4. that there are numerous concepts (such as 'integrity,' 'empathy,' 'fairmindedness') in natural languages which, though they are not themselves intellectual standards, presuppose intellectual standards.
5. that for humans to use intellectual standard words at a high level of skill requires systematic cultivation.
6. that though every subject and discipline implicitly presupposes the need to fulfill intellectual standards, in most cases these standards need to be explicit (in order to be properly monitored).
7. that the consistent and explicit satisfaction of intellectual standards is important to commanding the quality of one's life and, more generally, to creating societies that genuinely value critical thinking.

In sum, we offer a brief analysis of some of the most important intellectual standards in the English language. We look at their opposites. We argue for their contextualization within subjects and disciplines. And, we call attention to the forces that undermine their skilled use in thinking well.

³ In speaking of "intellectual standards," it may often be more accurate to say "intellectual standard words." For purposes of simplicity and ease of reading, we often use the shorter term 'intellectual standards.' The relationship between concepts and word use is complicated. It would be difficult to understand or explain intellectual standards without using and talking about intellectual standard words. The critical analytic vocabulary of the English language, rightly used, is the key to command of intellectual standards for English speakers. The standards may go beyond present usage in that they may encompass implications of which we are not aware. But without cultivated command of intellectual standards, the foundations cannot be laid. This is a point that has been illuminated by Wittgenstein and many of those influenced by his thought. In short, when we use the term "intellectual standards," we generally mean "intellectual standard words established by educated use." Intellectual standards, as we understand them, are conceptualizations [in disciplined human minds] of possible strengths and weaknesses in thinking. They are embodied in the proper use of intellectual standard words in context.

⁴ Though we focus here on intellectual standards available in the English language, we hypothesize that similar webs of intellectual standards exist in every natural language, though perhaps with differing nuances.

Intellectual Standards

Intellectual standards are given in the uses of intellectual standard words (when properly applied in context).

Intellectual standards are necessary for cultivating the intellect and living a rational life.

Essential intellectual standards are part of a much larger set of intellectual standards that form constellations of similar meanings and are prevalent throughout natural languages.

To properly conceptualize any given intellectual standard, it is important to conceptualize its opposite.

To properly conceptualize any given intellectual standard, we must also conceptualize its nuanced differences in a variety of contexts.

Intellectual standards are presupposed in many concepts in modern natural languages.

Intellectual standards are presupposed in every subject and discipline.

By way of introduction, we will begin with some essential intellectual standards.

Some Essential Intellectual Standards

We postulate that there are at least nine intellectual standards important to conducting affairs of everyday life. These are, again, clarity, precision, accuracy, relevance, depth, breadth, logicalness, significance, and fairness. The importance of these intellectual standards is given in their indefeasibility. We suggest, in other words, that it is unintelligible to claim that any instance of reasoning is both sound and yet in violation of these standards. To see this, suppose someone were to claim that her/his reasoning is sound regarding “x,” though, at the same time, admittedly unclear, inaccurate, imprecise, irrelevant, narrow, superficial, illogical, trivial and unfair with respect to “x.” Beginning with these nine intellectual standards will help set the stage for conceptualizing intellectual standards (more broadly) and for appreciating the essential role of intellectual standards in human reasoning.

An explication of these essential intellectual standards follow:⁵

Clarity: Understandable, the meaning can be grasped; to free from confusion or ambiguity, to remove obscurities.

Clarity is a ‘gateway’ standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we don’t yet know what it is saying. For example, the question “What can be done about the education system in America?” is unclear. In order to adequately address the question, we would need to have a clearer understanding of what the person asking the question is considering the “problem” to be. A clearer question might be “What can educators do to ensure that students learn the skills and abilities which help them function successfully on the job and in their daily decision-making?”

Thinking is always more or less clear. It is helpful to assume that we do not fully understand a thought except to the extent that we can elaborate, illustrate, and exemplify it. Questions that focus on clarity in thinking include:

- Could you elaborate on that point? or Do I need to elaborate on that point?
- Could you express that point in another way? or Can I express that point differently?
- Could you give me an illustration? or Should I give an illustration?
- Could you give me an example? or Should I provide an example?
- Let me state in my own words what I think you just said. Am I clear about your meaning?
- I hear you saying “_____.” Am I hearing you correctly, or have I misunderstood you?

⁵ Throughout this essay we explore a variety of intellectual standards as they are implied in the everyday use of words. However, most words in everyday use have more than one meaning and sometimes have meanings irrelevant to the assessment of intellectual quality. Be advised, therefore, that when we refer to a term as an intellectual standard or to a term presupposing intellectual standards we are referring exclusively to those uses of the word or term relevant to the proper assessment of reasoning.

Accuracy: free from errors, mistakes or distortions; true, correct.

A statement can be clear but not accurate, as in “Most dogs weigh more than 300 pounds.”

Thinking is always more or less accurate. It is useful to assume that we have not fully assessed it except to the extent that we have checked to determine whether it represents things as they really are. Questions that focus on accuracy in thinking include:

- How could we check that to see if it is true?
- How could we verify these alleged facts?
- Can we trust the accuracy of these data given the source from which they come?

Precision: exact to the necessary level of detail, specific.

A statement can be both clear and accurate, but not precise, as in “Jack is overweight.” (We don’t know how overweight Jack is, one pound or 500 pounds.)

Thinking is always more or less precise. We can probably assume we do not fully understand it except to the extent that we can specify it in detail. Questions that focus on precision in thinking include:

- Could you give me more details about that?
- Could you be more specific?
- Could you specify your allegations more fully?

Relevance: bearing upon or relating to the matter at hand; implies a close logical relationship with, and importance to, the matter under consideration.

A statement can be clear, accurate, and precise, but not relevant to the question at issue. For example, students often think that the amount of effort they put into a course should be used in raising their grade in a course. Often, however, “effort” does not measure the quality of student learning, and when this is so, effort is irrelevant to their appropriate grade.

Thinking is always capable of straying from the task, question, problem, or issue under consideration. It is useful to assume we have not fully assessed thinking except to the extent that we have considered all issues, concepts, and information relevant to it. Questions that focus on relevance in thinking include:

- I don’t see how what you said bears on the question. Could you show me how it is relevant?
- Could you explain the connection between your question and the question we are addressing?
- How does this fact bear upon the issue?
- How does this idea relate to this other idea?
- How does your question relate to the issue we are dealing with?

Depth: containing complexities and multiple interrelationships, implies thoroughness in thinking through the many variables in the situation, context, idea, question.

A statement can be clear, accurate, precise, and relevant, but superficial (that is, lack depth). For example, the statement “Just Say No,” which was used for a number of years to discourage children and teens from using drugs, is clear, accurate, precise, and relevant. Nevertheless, those who take this injunction to solve the social problem of unhealthy drug use fail to appreciate the true complexities in the problem. Their thinking is superficial at best.

Thinking can either function at the surface of things or probe beneath that surface to deeper matters and issues. We can assume we have not fully assessed a line of thinking except to the extent that we have fully considered all the important complexities inherent in it. Questions that focus on depth in thinking include:

- Is this question simple or complex? Is it easy or difficult to answer well and truly?
- What makes this a complex question?
- How are we dealing with the complexities inherent in the question?

Breadth: encompassing multiple viewpoints, comprehensive in view, wide-ranging and broadminded in perspective.

A line of reasoning may be clear, accurate, precise, relevant, and deep, but lack breadth (as in an argument from either the conservative or liberal standpoints which details the complexities in an issue, but only recognizes insights from one perspective).

Thinking can be more or less broad-minded (or narrow-minded) and breadth of thinking requires the thinker to reason insightfully within more than one point of view or frame of reference. We can assume we have not fully assessed a line of thinking except to the extent that we have determined how much breadth of thinking is required (and how much has in fact been exercised). Questions that focus on breadth in thinking include:

- What points of view are relevant to this issue?
- What relevant points of view have I ignored thus far?
- Am I failing to consider this issue from an opposing perspective because I am not open to changing my view?
- Have I entered the opposing views in good faith, or only enough to find flaws in them?
- I have looked at the question from an economic viewpoint. What is my ethical responsibility?
- I have considered a liberal position on the issue. What would conservatives say?

Logic: the parts make sense together, no contradictions; in keeping with the principles of sound judgment and reasonability.

When we think, we bring a variety of thoughts together into some order. When the combination of thoughts is mutually supporting and makes sense in combination, the thinking is logical. When the combination is not mutually supporting, is contradictory, or does not make sense, the combination is not logical.

Thinking can be more or less logical. It can be consistent and integrated. It can make sense together or be contradictory or conflicting. Questions that focus on logic include:

- Does all this fit together logically?
- Does this really make sense?
- Does that follow from what you said?
- Does what you say follow from the evidence?
- Before you implied this and now you are saying that, I don't see how both can be true. What exactly is your position?

Significance: having importance, being of consequence; having considerable or substantial meaning.

When we reason through an issue, we want to concentrate on the most important information (relevant to the issue) and take into account the most important ideas or concepts. Too often we fail to recognize that, though many ideas may be relevant to an issue, they may not be equally important. Similarly, we may fail to ask the most important questions and instead become mired in superficial questions, questions of little weight. In college, for example, few students focus on important questions such as, "What does it mean to be an educated person? What do I need to do to become educated?" Instead, students tend to ask questions such as, "What do I need to do to get an 'A' in this course? How many pages does this paper have to be? What do I have to do to satisfy this professor?"

Thinking can be more or less significant. It can focus on what is most substantive, what is of the highest consequence, what has the most important implications. Or it can focus on the trivial and superficial. Questions that focus on significance include:

- What is the most significant information we need to address this issue?
- How is that fact important in context?
- Which of these questions is the most significant?
- Which of these ideas or concepts is the most important?

Fairness: free from bias, dishonesty, favoritism, selfish-interest, deception or injustice.

We naturally think from our own perspective, from a point of view which tends to privilege our position. Fairness implies the treating of all relevant viewpoints alike without reference to one's own feelings or interests. Because we tend to be biased in favor of our own viewpoint, it is important to keep the intellectual standard of fairness at the forefront of our thinking. This is especially important when the situation may call on us to see things we don't want to see, or give something up we would rather hold onto.

Thinking can be more or less fair. Whenever more than one point of view is relevant to the situation or in the context, the thinker is obligated to consider those relevant viewpoints in good faith. To determine the relevant points of view, look to the question at issue. Questions that focus on fairness include:

- Does a particular group have some vested interest in this issue that causes them to distort other relevant viewpoints?
- Am I sympathetically representing the viewpoints of others?
- Is the manner in which we are addressing the problem fair - or is our vested interest keeping us from considering the problem from alternative viewpoints?
- Are concepts being used justifiably (by this or that group)? Or is some group using concepts unfairly in order to manipulate (and thereby maintain power, control, etc.?)
- Are these laws justifiable and ethical, or do they violate someone's rights?

Here is a useful diagram which can be used as a quick reference for these nine foundational intellectual standards.

Clarity

Could you elaborate further?
Could you give me an example?
Could you illustrate what you mean?

Accuracy

How could we check on that?
How could we find out if that is true?
How could we verify or test that?

Precision

Could you be more specific?
Could you give me more details?
Could you be more exact?

Relevance

How does that relate to the problem?
How does that bear on the question?
How does that help us with the issue?

Depth

What factors make this a difficult problem?
What are some of the complexities of this question?
What are some of the difficulties we need to deal with?

Breadth

Do we need to look at this from another perspective?
Do we need to consider another point of view?
Do we need to look at this in other ways?

Logic

Does all this make sense together?
Does your first paragraph fit in with your last?
Does what you say follow from the evidence?

Significance

Is this the most important problem to consider?
Is this the central idea to focus on?
Which of these facts are most important?

Fairness

Do I have any vested interest in this issue?
Am I sympathetically representing the viewpoints of others?

These important intellectual standards provide a good starting place for understanding intellectual standards; yet they represent only some of the many intellectual standards extant in the English language. Before we further explore intellectual standard terms, let us first step back a moment to briefly analyze the concept of intellectual standards itself.

The Concept of Intellectual Standards

The Idea of Intellectual Standards is Rooted in Natural Languages

Every term in the English language has established uses which are found in well-researched dictionaries. Thus to conceptualize intellectual standards, it is important to consider established uses of the terms 'intellectual' and 'standards' (as well as related terms). We need then to integrate insights from this analysis to formulate a reasonable conception of intellectual standards.

Exploring the Concept of Standards

Let us begin then with the term 'standard' or its synonym 'criterion.' Consider the following definitions:

Standard applies to some measure, principle, model, etc. with which things of the same class are compared in order to determine their quantity, value, quality, etc. [*standard of purity for drugs*]; *Criterion* applies to a test or rule for measuring the excellence, fitness, or correctness of something [*mere memory is no accurate criterion of intelligence*];⁶

Thus *standards* and *criteria* are rules or principles used to determine the quality of something, and accordingly whether to accept or reject it. They are used to judge or decide upon something, and can usually be used synonymously for this purpose.

Standards are Prevalent in Everyday Life

As humans we routinely use our judgment in determining what to accept and what to reject. We cannot do this without standards or criteria. Consider the following examples, paying particular attention to the "standards" used to determine quality in each case:

- To determine whether a loaf of bread is of acceptable quality, we might use the following standards, among others: the degree of rise of the loaf, inside texture, outside crust texture, thickness, lightness, and so forth. If we were pastry chefs creating recipes, we would use not only global standards, such as these, for assessing the quality of bread, but more precise and particular standards relevant to our taste and situation. These standards might include a specific degree of rise of the loaf, specific consistency of inner and outer texture, specific taste and weight of the loaf, and so forth. Once we settled on the particular standards for our recipe, each loaf baked thereafter would be compared with our set criteria. *The quality of each loaf would be judged based on these standards.*

⁶ Webster's New World College Dictionary, Fourth Edition, Wiley Publishing, 2007.

- To determine whether a tennis player under our direction (were we his or her coach) was likely to compete well at a particular level of play, we might first look at the average skill level of top players and use that skill level to formulate a set of standards by which to judge the competitiveness of our player's skills. In determining our standards, we would consider back court performance, net court performance, fitness level, mental stamina under pressure, average first and second serve percentages, ratios of winners to errors, our player's "track record" against established players, and so on. We would then compare our player's skills in these categories with the standards set by the top players at the level of play in question.
- To assess the quality of an actor auditioning for a play (were we the directors) we might consider the quality and intonation of voice, as well as the ability of the actor to deliver the lines in a convincing manner, to portray a given character accurately, to connect emotionally with the audience, and so forth. We would have standards in mind for each of these categories and compare audition performance with these standards. Some of our standards might be based in personal judgment given our analysis of the play and the role of various characters in it.

The use of standards in human life, we are arguing, is routine and pervasive, from deciding what to eat, to determining how to spend one's spare time, to choosing a career. Everywhere in human life, we construct and use standards. Consider for example, the following quote, (found on a coffee package in a hotel room):

"This estate grown coffee is my personal recipe, crafted with distinctive and exotic coffee beans and roasted in small batches to my exact standards."

... Wolfgang Puck

In short, we make judgments every day; and when we do we use standards. We can't form judgments without, at least, presupposing standards.

Moreover, for every skill area, there are standards to which people attempting to develop those skills aspire – in music, art, sports, parenting, marriage, public speaking, theatre, science, literature, architecture, indeed in every domain of human thought and action. The standards for excellence are set by those functioning at the highest levels.

Of course, people are differently motivated and have varying capacities for development in any particular skill area. Some can and do reach for the highest levels of performance. But many settle for lower standards of performance.

It might, perhaps, behoove us all to consider the standards we strive to fulfill in living our lives, and to raise these standards to the conscious level. For when we take command of these standards, we take command of the thoughts, desires and emotions that determine the quality of our lives.

Exploring the Term 'Intellectual'

Now that we have an idea of the common uses of the term 'standards' and some sense of the role that standards play in human life, let us consider the term 'intellectual.' Grasping the meaning of this term is somewhat more complex as it requires that we consider not only the term 'intellectual,' but related terms such as 'intelligent' and 'the intellect.' Moreover, such an analysis requires that we trace some important meanings implied by these terms, and then interrelate these meanings. This will be made more clear presently.

Let us first consider the terms 'intellectual,' 'intellect' and 'intelligent.'

The term 'intellectual' often means requiring the intellect, or having or showing a high degree of intelligence. The term 'intellect' implies the ability to reason or understand or to perceive relationships, differences, etc. It refers to that part of the mind which knows or understands. It may also imply the power of thought, great mental ability, or a high degree of intelligence. The terms 'intelligent' or 'intelligence' imply having or showing an alert mind, bright, perceptive, informed, clever, wise. They also generally imply the ability to learn or understand from experience, the ability to acquire and retain knowledge, the ability to respond quickly and successfully to new situations. They also characteristically imply or presuppose use of the faculty of reason in solving problems, directing conduct successfully, and making sound judgments.⁷

Note that within these meanings are several important concepts whose meanings are essential to our conception of intellectual standards – including 'to reason,' 'to know or comprehend,' and 'to make sound judgments.'

'To reason' entails the power to think rationally and logically and to draw inferences. 'To understand' is the faculty by which one understands, often together with the resulting comprehension. It entails superior power of discernment; enlightened intelligence. 'To make sound judgments' is the ability to assess situations or circumstances logically or accurately and draw reasonable conclusions. 'To know or comprehend' means to have a clear perception or understanding of; to be sure of. It entails clear and certain mental apprehension.⁸

The term 'intellectual,' when integrated with related terms, thus entails the use of sound reasoning and judgment in the pursuit of knowledge. It typically implies the superior powers of the intellect as well as the ability to use one's mind to make intelligent decisions, to use the faculty of reason in solving problems and directing conduct successfully. Finally, it suggests clear perception and the logical drawing of inferences.

⁷ These definitions are taken or slightly modified from those found in *Webster's New World College Dictionary, Fourth Edition*, Wiley Publishing, 2007.

⁸ *Ibid.*

The Concept of 'Intellectual Standards'

Taking into account the meanings and analysis above, we conceptualize intellectual standards in the following way:

the standards necessary for making sound judgments or for reasoning well, for forming knowledge (as against unsound beliefs), for intelligent understanding, for thinking rationally and logically.

In short, we use the term 'intellectual standards' to mean standards that further good judgment and rational understanding.⁹ They are essential for our mind's on-going awareness and assessment of the strengths and weaknesses in our thinking, and in the thinking of others. Whether focused on the inner structure of thought or its global qualities, intellectual standards are essential to functioning as reasonable, fairminded persons. We have no choice as to whether we use standards to assess thinking and perception; everyone does. Where we do have a choice is in the standards we use. Most people rarely seem to reflect upon the standards they use. Consequently, and because the fulfillment of intellectual standards is not natural to the mind, people tend to use default standards, ones that are often highly egocentric and sociocentric.

Skilled thinkers recognize the critical role of meeting intellectual standards in living a successful and rational life. They therefore routinely satisfy intellectual standards. They typically recognize when they, or others, are failing to meet them.

⁹ We believe that our conception of 'intellectual standards' is in keeping with educated uses of the terms 'intellectual' and 'standards' when joined. We realize that other defensible uses of the term 'intellectual standards' may well exist, or that the term (as any term) may change to serve additional purposes in the future.

Intellectual Standard Words Form Systems of Interrelated Meanings

Intellectual standards are best understood as a network of ideas that interconnect in various ways, that sometimes overlap, and that often vary along a continuum (serving a range of purposes). They help us make reasonable judgments and assess reasoning in ways that make most sense.

Intellectual standard terms can be specific or general in nature. They can entail other intellectual standard terms. They can have limited or broad use.

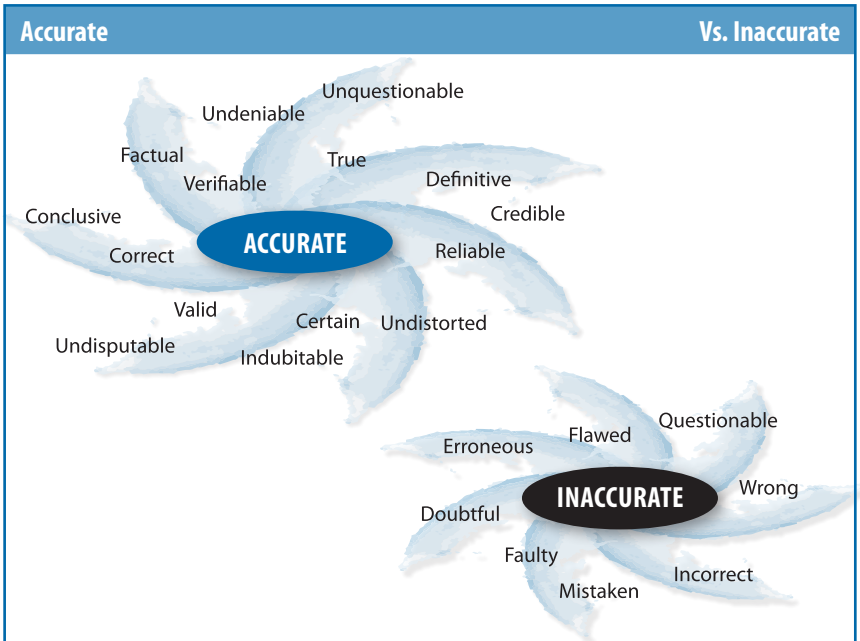
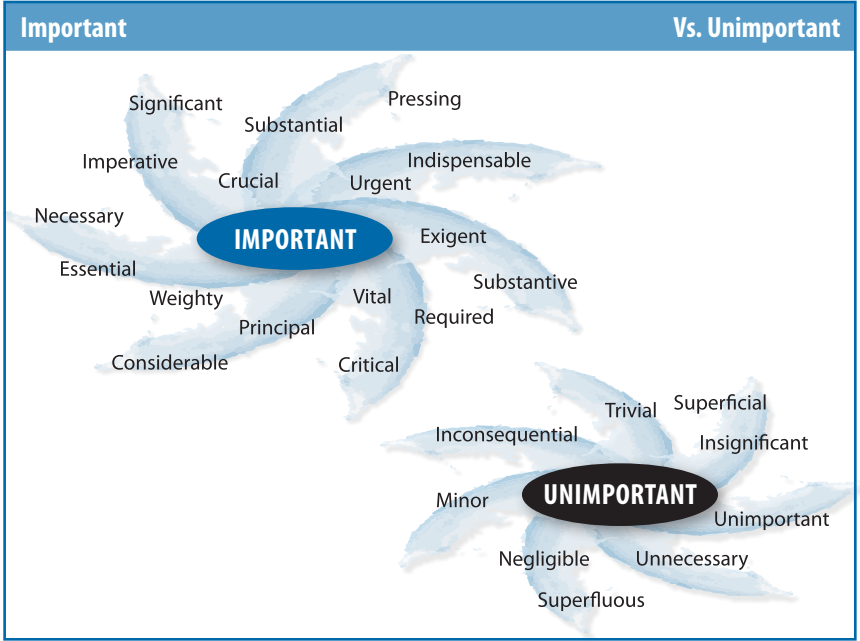
In this section we exemplify some of the ways in which intellectual standard words form what we might term 'constellations.' We focus on some of the most important and powerful intellectual standards in the English language. Realize that our examples are just that, a small set of cases from the vast array of intellectual standards in the language. We focus on standards that, if used regularly, will significantly improve the quality of human judgments and decisions. We present these standards in groupings with what might be considered the 'paradigm' concept in the middle, and related and similar concepts around that central concept.¹⁰ Each constellation contains a range of nuanced meanings within a central concept. Some may be used synonymously.

To the right of each constellation of intellectual standards you will find their opposites. To fully conceptualize any particular intellectual standard requires an understanding of how that standard can be violated in multiple contexts. This is most easily understood by studying intellectual standards in relationship with their opposites.

Again, our analysis represents a raw beginning, as there are at least hundreds of words in the English language that qualify as intellectual standard terms in particular contexts. Many additional terms presuppose the proper use of one or more intellectual standard. Our purpose, then, is not to generate an exhaustive list of intellectual standards - that might be encyclopedic in scope. Rather our aim is more modest, namely, to exemplify a rich tapestry of some of the most important interrelated intellectual standards in use in our language (whose criteria of fulfillment we can call upon to assess any instance of reasoning).

In this spirit, we have tried to stick to paradigm, not borderline cases.

¹⁰ As you view our "constellations," realize that there are multiple forms which these constellations can take, with different terms being placed in the center, depending on the "job" required of the words in specific contexts.



General Intellectual Standards Presuppose Specific Intellectual Standards

The standards we have considered thus far might be termed “micro intellectual standards,” as they pinpoint specific aspects of intellectual assessment. For example: Is the thinking *clear*? Is the information *relevant*? Is the thinking *consistent*? Though essential to skilled reasoning, meeting one or more micro standards does not necessarily fulfill the intellectual task at hand. Remember, thinking can be clear but not relevant; it can be relevant but not precise; it can be accurate but not sufficient, and so forth.

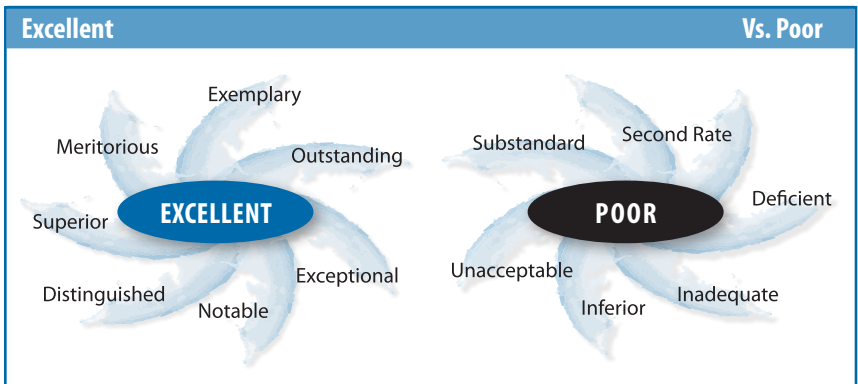
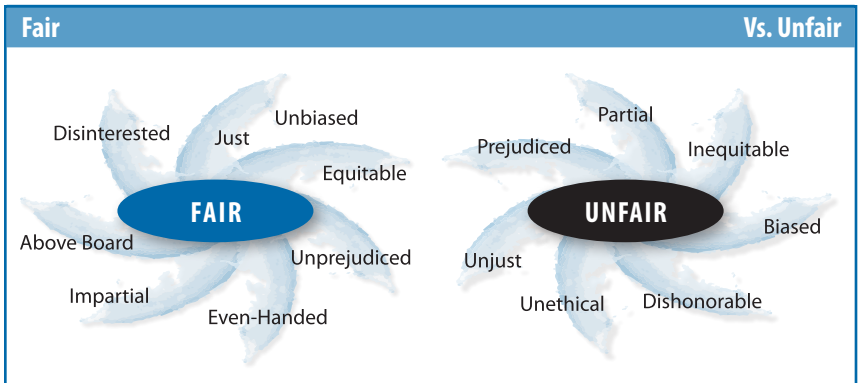
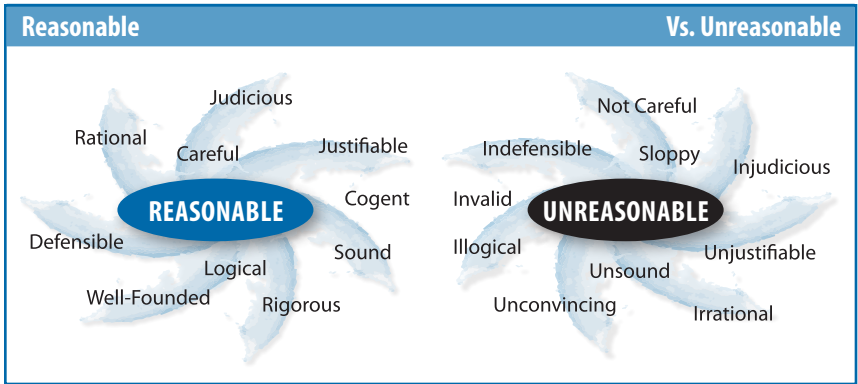
When the reasoning we need to engage in is monological, (that is, focused on a question with an established settlement procedure), micro intellectual standards may suffice. But to reason well through multilogical issues, (that is, problems or issues that require that we reason within conflicting points of view), we need not only micro, but ‘macro intellectual standards.’ Macro intellectual standards are broader in scope; they integrate our use of micro standards; they expand our intellectual understandings. For example, when reasoning through a complex issue, we need our thinking to be *reasonable* or *sound* (satisfying, in other words, broad intellectual standards). For thinking to be *reasonable* or *sound*, it needs, at minimum, to be *clear*, *accurate* and *relevant*. Moreover, when more than one viewpoint is *relevant* to an issue, we need to be able to compare, contrast, and integrate insights from relevant viewpoints before taking a position on the issue ourselves. Thus the use of macro intellectual standards (such as *reasonability* and *soundness*) help guide the reasoning toward depth, comprehensiveness and integration of thought.

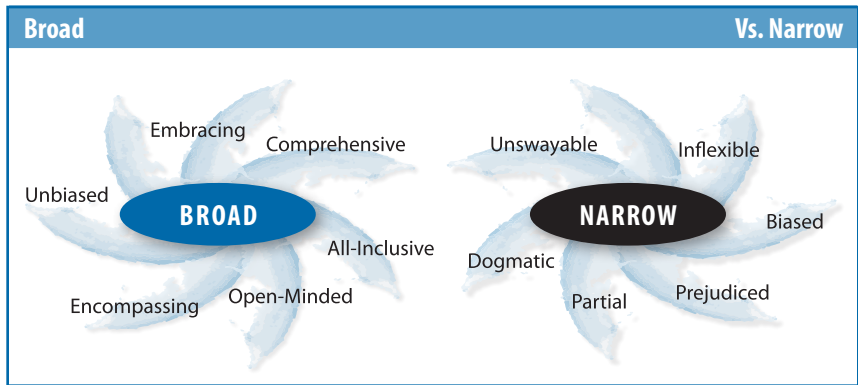
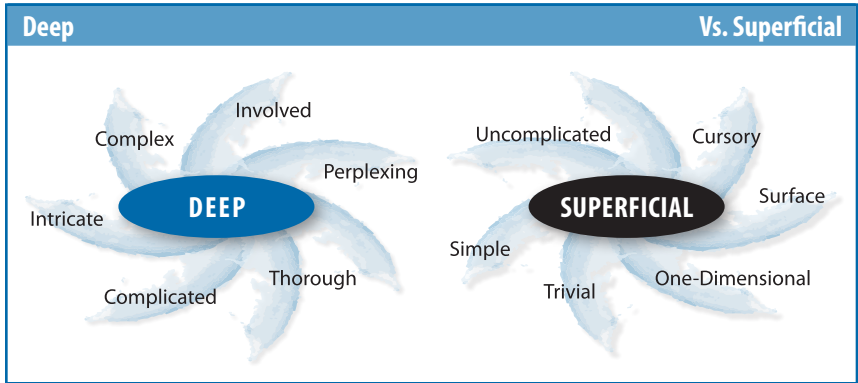
When we understand the importance of macro intellectual standards in human thought, we can explicitly guard against the selective use of micro intellectual standards.

Micro Intellectual Standards, Macro Intellectual Standards and the Problem of Vested Interest

Insofar as humans use intellectual standards, we tend to use those standards that enable us to maintain and forward our own self-serving agendas and vested interests. For instance, when reasoning through an issue, we tend to consider that information (though perhaps accurate and relevant) that supports our selfish or group interests. Simultaneously, we tend to ignore relevant information and distort (or inaccurately represent) viewpoints which differ from our own. We tend to see our own desires as more *important* than the needs and desires of others. We therefore require sensitivity to macro intellectual standards to help us move beyond the selective, narrow and biased use of micro intellectual standards. Put another way, when we use intellectual standards in a *strong-sense*, we strive to use them fairly, with as much concern with the rights and needs of others as with our own rights and needs. When we use them in a *weak-sense*, we pick and choose those standards which serve our desires without concern for how pursuit of those desires might impact others.

Consider the following macro or multilogical intellectual standards and their opposites.





Consider the following brief definitions of these unifying standards. Note how they overlap and presuppose micro intellectual standards:¹¹

- Cogent:** Appealing to the intellect or powers of reasoning; to the point; relevant; pertinent.
- Convincing:** Appearing worthy of belief; plausible; persuading or assuring by evidence.
- Careful:** Solicitously mindful; taking pains in one's work; exact; thorough.
- Forceful:** Powerful; vigorous; effective because it is based in sound reasoning and evidence.
- Justifiable:** That which can be shown to be or can be defended as being valid, fair, warranted; well-grounded or defensible, given the evidence.

¹¹ All dictionary definitions used in this section come from one or more of the sources included in the references section at the end of this document and can be found in any well-researched dictionary.

There are Nuanced Similarities and Differences Between and Among Intellectual Standards

As we have said before, intellectual standards are best understood as a network of interconnected, overlapping concepts, rather than a list of atomic disconnected ideas. A well-researched dictionary will sometimes illuminate the nuances among them, as well as identify how some intellectual standards imply other intellectual standards, as in the following examples:¹²

The following adjectives describe what relates to and has a direct bearing on the matter at hand.

Something **relevant** is connected with a subject or issue: *performed experiments relevant to her research.*

Pertinent suggests a logical, precise relevance: *assigned pertinent articles for the class to read.*

Germane implies close kinship and appropriateness: *“He asks questions that are germane and central to the issue”* (Marlin Fitzwater).

Something **material** is not only relevant but also crucial to a matter: *reiterated the material facts of the lawsuit.*

Apposite implies a striking appropriateness and pertinence: *used apposite verbal images in the paper.*

Something **apropos** is both to the point and opportune: *an apropos comment that concisely answered my question.*

The following nouns refer to the quality of being in accord with fact or reality.

Truth is a comprehensive term that in all of its nuances implies accuracy and honesty: *“We seek the truth, and will endure the consequences”* (Charles Seymour).

Veracity is adherence to the truth: *“Veracity is the heart of morality”* (Thomas H. Huxley).

Verity often applies to an enduring or repeatedly demonstrated truth: *“beliefs that were accepted as eternal verities”* (James Harvey Robinson).

Verisimilitude is the quality of having the appearance of truth or reality: *“merely corroborative detail, intended to give artistic verisimilitude to an otherwise bald and unconvincing narrative”* (W.S. Gilbert).

¹² Ibid.

The following adjectives mean free from favoritism, self-interest, or preference in judgment.

Fair is the most general: *a fair referee; a fair deal.*

Just stresses conformity with what is ethically right or proper: *“a just and lasting peace”* (Abraham Lincoln).

Equitable implies justice dictated by reason, conscience, and a natural sense of what is fair: *an equitable distribution of gifts among the children.*

Impartial emphasizes lack of favoritism: *“the cold neutrality of an impartial judge”* (Edmund Burke).

Unprejudiced means without preconceived opinions or judgments: *an unprejudiced evaluation of the proposal.*

Unbiased implies absence of a preference or partiality: *gave an unbiased account of her family problems.*

Objective implies detachment that permits impersonal observation and judgment: *an objective jury.*

Dispassionate means free from or unaffected by strong emotions: *a dispassionate reporter.*

Now let us consider the relationship between natural thought processes and the use of intellectual standards.

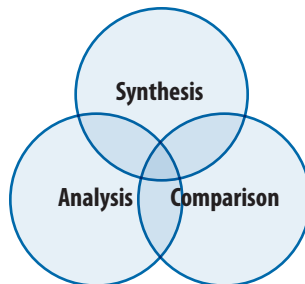
Natural Cognitive Processes Do Not Necessarily Presuppose the Proper Use of Intellectual Standards

Cognitive processes are important in human thought – processes such as classifying, inferring, assuming, planning. However it is important to guard against the assumption that engaging these processes automatically ensures skilled and disciplined reasoning. For example, whenever we plan, we do not necessarily plan well. Sometimes we plan poorly. The mere fact of planning does not automatically carry with it high quality cognition.

To ensure excellent thought, we need to meet intellectual standards when engaging in cognitive processes. Here are some cognitive processes naturally occurring in the human mind (with similar terms grouped together):

- Analyzing
- Synthesizing, integrating
- Comparing, contrasting
- Inferring, interpreting, concluding, deducing
- Assuming, presuming
- Conceptualizing
- Evaluating
- Planning
- Monitoring
- Reviewing
- Reflecting
- Gathering (e.g. information)
- Recognizing
- Classifying, grouping, sorting
- Distinguishing
- Sequencing
- Perceiving cause and effect
- Predicting
- Focusing attention
- Committing to memory
- Testing ideas and hypotheses

In-and-of-themselves, none of these processes is guaranteed to automatically function at a high level of skill in the human mind. Critical scrutiny using intellectual standards is often required. To exemplify, let us consider three cognitive processes:



need research that is not influenced by industry money (*The New York Times*, June 8, 2008).”

If it is in a researcher's financial interest to find that a behavioral problem exists for which medicine can be prescribed, a medicine developed by the company funding the research, it is only reasonable to question whether and to what extent such studies can be said to be *unbiased*.

Or consider an example in the field of agriculture. For decades, the primary form of vegetable farming has been large crop farming with mass use of chemical pesticides. In the meantime, scientists have become increasingly aware of the myriad problems caused by overuse of pesticides. Two of the most significant of these problems include ecological destruction and human disease escalation (caused by pesticide exposure through ingestion and inhalation). For many years, eminent scientists world-wide have spoken out against these destructive practices. And yet the problem largely remains. By continuing to overuse pesticides, the agricultural community sanctions reasoning, tacitly or explicitly, that violates intellectual standards. By ignoring relevant and significant information, by failing to think through logical implications, by covering up or ignoring important evidence, agriculturalists violate some of the very ideals they advance. It seems reasonable to link this failure to the problem of vested interest - the simple fact that farming with pesticides is cheaper than farming without them.

Intellectual Standards Most Relevant to Reasoning Within the Disciplines Need to Be Articulated

As we have said, every field of study presupposes and strives to meet basic and essential intellectual standards such as *accuracy*, *relevance*, and *logicalness*. However some intellectual standards may be more important to reasoning well within any given field than other intellectual standards. Therefore, it is up to those working within each discipline to articulate the intellectual standards most important to reasoning through the problems and issues in the discipline, to detail how the standards should be contextualized within the field.

By explicitly contextualizing intellectual standards within the disciplines, we raise our awareness of them; we are more likely to consistently meet them; we are more likely to see when they are being ignored or violated.

As we have mentioned, careful analysis of any discipline helps illuminate the intellectual standards most necessary to thinking well within it. To lay bare this logic, and keeping in mind the elements or structures of thought embedded in every discipline, we can begin with the following 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?

Once we have answered these questions, we can then begin to apply intellectual standards to the logic of the discipline and to see how intellectual standards are most usefully contextualized within it. To exemplify this, we will introduce some of the ways in which intellectual standards are essential to careful reasoning within two disciplines: ecology and electrical engineering. We will first lay out the essential logic of the discipline as seen through its component parts.¹⁵ We will then briefly comment on some of the intellectual standards essential to skilled reasoning within that logic.

The Logic of Ecology

Purposes of Ecologists: Ecologists seek to understand plants and animals as they exist in nature, with emphasis on their interrelationships, interdependence, and interactions with the environment. They work to understand all the influences that combine to produce and modify an animal or given plant, and thus to account for its existence and peculiarities within its habitat.

Questions that Ecologists Ask: How do plants and animals interact? How do animals interact with each other? How do plants and animals depend on one another? How do the varying ecosystems function within themselves? How do they interact with other ecosystems? How are plants and animals affected by environmental influences? How do animals and plants grow, develop, die, and replace themselves? How do plants and animals create balances between each other? What happens when plants and animals become unbalanced?

Information that Ecologists Use: The primary information used by ecologists is gained through observing plants and animals themselves, their interactions, and how they live within their environments. Ecologists note how animals and plants are born, how they reproduce, how they die, how they evolve, and how they are affected by environmental

¹⁵ Again, for a deeper understanding of the analysis of thought, see Linda Elder and Richard Paul, *The Thinker's Guide to Analytic Thinking* (Foundation for Critical Thinking Press, 2007), www.criticalthinking.org



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Dr. Richard Paul is a major leader in the international critical thinking movement. He is Director of Research at the Center for Critical Thinking, and the Chair of the National Council for Excellence in Critical Thinking, author of over 200 articles and seven books on critical thinking. Dr. Paul has given hundreds of workshops on critical thinking and made a series of eight critical thinking video programs for PBS. His views on critical thinking have been canvassed in *New York Times*, *Education Week*, *The Chronicle of Higher Education*, *American Teacher*, *Educational Leadership*, *Newsweek*, *U.S. News and World Report*, and *Reader's Digest*.

