✦✦ Chapter 21

Strategies:
Thirty-Five Dimensions of Critical Thinking

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Abstract

The following strategies, originally developed to help teachers remodel lessons and redesign instruction in the Critical Thinking Handbook *series, indicate how critical thinking principles can be transformed into teaching strategies. The various strategies overlap; each illuminates a dimension of critical thought.*

✦ *Introduction*

The purpose of this chapter is to illustrate how the concept of the autonomous, precise, fairminded thinker can be translated into classroom activities and discussions. We have broken the global concept of critical thinking down into 35 aspects or instructional strategies. Each strategy section has three parts. The "principle" provides the theory of critical thinking on which the strategy is based and links the strategy to the ideal of the fairminded critical thinker. We could have labeled it "What the Critical Thinker Does, and Why". We included it because we are convinced that one cannot do or teach critical thinking well without understanding why one should honor principles of critical thought, and to help overcome the tendency in education to treat insights and skills in isolation from each other. The "application" provides examples of when and how the strategy can be used in the classroom. Our lists of possible questions are often larger and more detailed here than in the remodels, and sometimes our remarks are general. We tried to provide some idea of when the principle could apply, to describe ways texts and some standard instructional practices can undermine or interfere with students learning the principle, and some initial suggestions to further illustrate and clarify the principle and get you started developing your own techniques for teaching it.

Here is an example. The thirteenth strategy on our list, ***S–13,*** is called "Clarifying Issues, Conclusions, or Beliefs". The principle that underlies it is briefly characterized as follows:

Principle

The more completely, clearly, and accurately an issue or statement is formulated, the easier and more helpful the discussion of its settlement or verification. Given a clear statement of an issue, and prior to evaluating conclusions or solutions, it is important to recognize what is required to settle it. And before we can agree or disagree with a claim, we must understand it clearly. It makes no sense to say "I don't know what you mean, but I deny it, whatever it is." Critical thinkers make sure that understanding precedes judgment. They routinely distinguish facts from interpretations, opinions, judgments, or theories. They seek to express themselves clearly and precisely.

Following the principle is an explanation of some of the ways we might teach for it:

Application

Teachers should encourage children to slow down and reflect before coming to conclusions. When discussing an issue, the teacher can ask students first, *"How would you describe the problem?"* Children should be encouraged to continually reformulate the issue in light of new information. They should be encouraged to see how the first statement of the issue or problem is rarely best (that is, most accurate, clear, and complete) and that they are in a better position to settle a question *after* they have developed as clear a formulation as possible.

When talking about an issue, teachers can have children discuss such questions as,*"Do we understand the issue? Do we know how to get an answer? Have we stated it fairly? Are the words clear? Are we evaluating anything? What? Why? How can we get the evidence we need?"*

When a statement is unclear, the class can discuss such questions as, *"How can we know whether or not this is it? Are any words or phrases unclear? Is there a clearer way to say this? Is there a more accurate way to say this? Can it be rephrased? Do the different ways of putting it say the same thing?"*

This strategy provides a way of remodelling lessons that focus on "Fact/Opinion," or which have vague passages of text.

The reader should keep in mind the connection between the principles and applications on the one hand, and the character traits of a fairminded critical thinker on the other. Our aim is not a set of disjointed skills, but an integrated, committed, thinking person. All of the pieces of the remodelling process — understanding what critical thinking is and why one should do it; breaking the concept into teachable components; inventing ways to help students learn and practice critical thought; evaluating lessons; and improving them — all fit together. These activities are interdependent. Figuring out how to teach a particular principle helps you better understand what critical thinking is (and

isn't). Analyzing and evaluating a lesson helps you see how critical thinking applies to particular situations. Clarifying the global concept of critical thinking helps you keep your focus on its most important features, and suggests ways of understanding and teaching specific principles and skills.

The strategies listed below are divided into three categories — one for the affective and two for the cognitive. This of course is not to imply that the cognitive dimension of critical thinking should be given twice as much emphasis. Indeed, the affective dimension is every bit as important to critical thinking. No one learns to think critically who is not motivated to do so. In any case, whatever dimension is emphasized, the other dimension should be integrated. We want students to continually use their emerging critical thinking skills and abilities in keeping with the critical spirit, and the critical spirit can be nurtured only when actually practicing critical thinking in some (cognitive) way. One cannot develop one's fairmindedness, for example, without actually thinking fairmindedly. One cannot develop one's intellectual independence without actually thinking independently. This is true of all the essential critical thinking traits, values, or dispositions. They are developmentally embedded in thinking itself. In teaching for critical thinking in a strong sense, the affective dimension of thinking is fully as important as the cognitive.

The List of Strategies

Affective Strategies

S-1 thinking independently
S-2 developing insight into egocentricity or sociocentricity
S-3 exercising fairmindedness
S-4 exploring thoughts underlying feelings and feelings underlying thoughts
S-5 developing intellectual humility and suspending judgment
S-6 developing intellectual courage
S-7 developing intellectual good faith or integrity
S-8 developing intellectual perseverance
S-9 developing confidence in reason

Cognitive Strategies — Macro-Abilities

S-10 refining generalizations and avoiding oversimplifications
S-11 comparing analogous situations: transferring insights to new contexts
S-12 developing one's perspective: creating or exploring beliefs, arguments, or theories
S-13 clarifying issues, conclusions, or beliefs
S-14 clarifying and analyzing the meanings of words or phrases
S-15 developing criteria for evaluation: clarifying values and standards
S-16 evaluating the credibility of sources of information
S-17 questioning deeply: raising and pursuing root or significant questions
S-18 analyzing or evaluating arguments, interpretations, beliefs, or theories
S-19 generating or assessing solutions
S-20 analyzing or evaluating actions or policies
S-21 reading critically: clarifying or critiquing texts
S-22 listening critically: the art of silent dialogue
S-23 making interdisciplinary connections
S-24 practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives
S-25 reasoning dialogically: comparing perspectives, interpretations, or theories
S-26 reasoning dialectically: evaluating perspectives, interpretations, or theories

Cognitive Strategies — Micro-Skills

S-27 comparing and contrasting ideals with actual practice
S-28 thinking precisely about thinking: using critical vocabulary
S-29 noting significant similarities and differences
S-30 examining or evaluating assumptions
S-31 distinguishing relevant from irrelevant facts
S-32 making plausible inferences, predictions, or interpretations
S-33 giving reasons and evaluating evidence and alleged facts
S-34 recognizing contradictions
S-35 exploring implications and consequences

✦ *The Interdependence of Traits of Mind*

Just as the cognitive and affective dimensions are interdependent and intertwined, so also are the various individual strategies. For purposes of learning, we articulate separate principles and applications. In the beginning, the connections between them may be obscure. Nevertheless, eventually we begin to discover how progress with any one principle leads inevitably to other principles. To see this, let us look first at the individual strategies in the affective dimension.

Affective strategies are interdependent because the intellectual traits they imply develop best in concert with each other. Consider intellectual humility. To become aware of the limits of our knowledge, we need the courage to face our own prejudices and ignorance. To discover our own prejudices in turn, we often must empathize with and reason within points of view toward which we are hostile. To achieve this end, we must typically persevere over a period of time, for learning to empathically enter a point of view against which we are biased takes time and significant effort. That effort will not seem justified unless we have the confidence in reason to believe we will not be "tainted" or "taken in" by whatever is false or misleading in the opposing viewpoint. Furthermore, merely believing we can survive serious consideration of an "alien" point of view is not enough to motivate most of us to consider them seriously. We must also be motivated by an intellectual sense of justice. We must recognize an intellectual responsibility to be fair to views we oppose. We must feel obliged to hear them in their strongest form to ensure that we are not condemning them out of ignorance or bias on our part. At this point, we come full circle back to where we began: the need for intellectual humility.

To begin at another point, consider intellectual good faith or integrity. Intellectual integrity is clearly a difficult trait to develop. We are often motivated, generally without admitting to or being aware of this motivation, to set up inconsistent intellectual standards. Our egocentric or sociocentric tendencies make us ready to believe positive information about those we like, and negative information about those we dislike. We are likewise strongly inclined to believe what serves to justify our vested interest or validate our strongest desires. Hence, all humans have some innate mental tendencies to operate with double standards, which of course is paradigmatic of intellectual bad faith. Such modes of thinking often correlate quite well with getting ahead in the world, maximizing our power or advantage, and getting more of what we want.

Nevertheless, it is difficult to operate explicitly or overtly with a double standard. We therefore need to avoid looking at the evidence too closely. We need to avoid scrutinizing our own inferences and interpretations too carefully. At this point, a certain amount of intellectual arrogance is quite useful. I may assume, for example, that I know just what you're going to say (before you say it), precisely what you are really after (before the evidence demonstrates it), and what actually is going on (before I have studied the situation

carefully). My intellectual arrogance may make it easier for me to avoid noticing the unjustifiable discrepancy between the standards I apply to you and the standards I apply to myself. Of course, if I don't have to empathize with you, that too makes it easier to avoid seeing my duplicity. I am also better positioned if I lack a keen need to be fair to your point of view. A little background fear of what I might discover if I seriously considered the consistency of my own judgments can be quite useful as well. In this case, my lack of intellectual integrity is supported by my lack of intellectual humility, empathy, and fairmindedness.

Going in the other direction, it will be difficult to use a double standard if I feel a responsibility to be fair to your point of view, see that this responsibility requires me to view things from your perspective empathically, and do so with some humility, recognizing I could be wrong, and you right. The more I dislike you personally, or feel wronged in the past by you or by others who share your way of thinking, the more pronounced in my character the trait of intellectual integrity and good faith must be to compel me to be fair.

✦ *Distinguishing Macro-Abilities from Micro-Skills*

Our reason for dividing cognitive strategies into macro-abilities and micro-skills is not to create a hard and fast line between the most elementary skills of critical thinking (the micro-skills) and the process of orchestrating those elementary skills, but rather to provide teachers with a way of thinking about two levels of learning. We use these two levels in most complex abilities. For intuitive examples, consider what is involved in learning to play the piano, learning to play good tennis, mastering ballet, or becoming a surgeon. In each of these areas, there is a level of skill learning which focuses on the most elementary of moves: for example, learning to practice the most elementary ballet positions at the bar, learning to play scales on the piano, or learning to hit various tennis strokes on the backboard. One must often return to this micro-level to ensure that one keeps the fundamentals well in hand. Nevertheless, dancing ballet is not practicing at the bar. Playing the piano is not simply playing scales. And hitting tennis balls against a backboard is not playing tennis. One must move to the macro level for the real thing. So, too, in critical thinking, students have to learn the fundamentals: what an assumption is, what an implication is, what an inference and conclusion are, what it is to isolate an issue, what it is to offer reasons or evidence in support of what one says, how to identify a contradiction or a vague sentence.

But thinking critically in any actual situation is typically doing something more complex and holistic than this. Rarely in thinking critically do we do just one elementary thing. Usually we have to integrate or make use of a variety of elementary critical thinking skills. For example, when we are reading (a macro-ability) we have to make use of a variety of critical thinking

micro-skills, and we have to use them in concert with each other. We might begin by reflecting on the implications of a story or book title. We might then begin to read the preface or introduction and start to identify some of the basic issues or objectives the book or story is focused on. As we proceed, we might begin to identify particular sentences that seem vague to us. We might consider various interpretations of them. As we move along, we would doubtless dip into our own experience for possible examples of what the author is saying. Or we might begin to notice assumptions the author is making. We would be making all of these individual moves as part of one integrated activity: the attempt to make sense of, to follow, what we are reading. As always, the whole is greater than and more important than the parts. We do not read to practice our critical thinking micro-skills; we use our critical thinking micro-skills in order to read, or better, in order to read clearly, precisely, and accurately.

Standard instruction and many approaches to teaching critical thinking or thinking skills often fail here. They over-emphasize drill in micro-skills and neglect their use. Being able to find assumptions only when someone tells you to is of little value. Articulating and evaluating assumptions helps one only if one does it when appropriate. This requires thinkers to notice for themselves when a questionable assumption is made. Macro abilities cannot be taught through drill. They must be developed and practiced in the context of some reasoning. Keep this principle of interdependence in mind as you read through the various strategies.

✦ *Have We Left Out Any Important Strategies?*

As you begin to use the principles of critical thinking we have formulated in your teaching, you may wonder whether our list is complete. You may wonder, in other words, whether we may have left out any important critical thinking principles. The answer to this is "Yes and no." "No" in the sense that all of the important critical thinking principles are at least implicit in the ones we have formulated. "Yes" in the sense that some of what is merely implicit might properly be made explicit.

To exemplify this point, consider these insightful suggestions which we recently received from Rex Dalzell of New Zealand.

> With respect to your list of strategies, I would like to suggest, with due intellectual humility, that the list could be usefully expanded by the addition of a further four strategies as follows:

Affective Strategies

Developing Intellectual Curiosity

> In the affective area, I believe the development of an attitude of intellectual curiosity is of prime importance. Although there are elements of this dimension in other characteristics (e.g., independence

of thought, intellectual perseverance, etc.), and while the whole notion of critical thinking implies the presence of this attribute, it seems to me sufficiently important to warrant an explicit category of its own.

Critical thinkers need to be curious about their environment, they need to seek explanations of apparent discrepancies and they need to speculate as to possible causes of these discrepancies. In short, they need to be predisposed to wonder about the world around them. This sense of wonder, this intellectual curiosity that seeks explanations and proffers solutions, is something that can be and needs to be encouraged and developed. For this reason I believe it would be helpful to include it as a separate stand-alone category in any overall schema.

Developing Social Sensitivity

In addition to developing insight into egocentricity and sociocentricity so that desirable levels of self-awareness are achieved it is also necessary, I believe, for critical thinkers to develop a high level of social sensitivity. By this I mean that critical thinkers need to become sensitive to the social situation they find themselves in so that they can judge effectively when it is and when it is not appropriate to exercise, at least overtly, their critical thinking skills. It is my experience that with some critical thinkers, particularly the "born again, evangelical" variety, they are quite insensitive to the social milieu in which they find themselves. Without due regard for the sensitivity of the situation, they launch forth with their battery of critical thinking skills and often destroy any possibility of a productive outcome.

In addition to being able to recognize the limits of their knowledge and being able to suspend judgment, critical thinkers also need to know when to put their skills into operation and when and how to articulate the results. Listing social sensitivity as a separate category would, I believe, be useful in helping critical thinkers develop this skill.

COGNITIVE STRATEGIES: MACRO-ABILITIES

Observing Critically

In addition to reading critically and listening critically, I believe it is very important for critical thinkers to learn how to observe critically. Intellectual curiosity is a necessary but not sufficient condition for critical observation to occur. Critical thinkers need to "see" as well as "look at" what is in their environment. They need to be trained to see the details of their surroundings, physical as well as social, and to accurately recall just exactly what they have seen. Most, if not all, of the micro-cognitive skills depend on this critical observation as a basis for productive application. As with intellectual curiosity and social sensitivity it seems to me that critical observation is a skill that merits recognition in its own right.

Expressing Precisely

> While precision is an integral feature of all critical thinking and is highlighted by such macro skills as clarifying issues, conclusions, or beliefs, clarifying and analyzing the meanings of words and phrases, the overall emphasis is on precision of analysis rather than on precision of expression. While precision of expression is implied in many of the listed skills — how else for example, could one engage successfully in Socratic discussion or reasoned dialogue or dialectic without such precision? — it seems to me that it would be helpful to list it as a separate skill. If critical thinkers are not able to express themselves with precision then their overall effectiveness is greatly reduced.

You may decide to add these four principles to your personal list, even though we received them too late to incorporate them formally in this volume. In any case, it would be quite instructive to try to fill out these descriptions and write an "application section" for each of them. Keep this awareness alive as you begin to work out your own unique application of critical thinking principles.

Note About Applications

The purpose of the following strategy list is to further clarify the basic principles of critical thinking, but not necessarily to provide applications of each strategy for each grade level. Teachers should experiment with the applications that seem appropriate and plausible for their students. Once you understand a range of applications (some at your grade level, some not), you will be able to begin to think up applications of your own. So do not assume that every application we provide is appropriate for your class. Experiment with an assortment of strategies and you will end up with a wide variety that works for your students.

S-1 Thinking Independently

Principle

Critical thinking is autonomous thinking, thinking for oneself. Many of our beliefs are acquired at an early age, when we have a strong tendency to form beliefs for irrational reasons (because we want to believe, because we are rewarded for believing). Critical thinkers use critical skills and insights to reveal and eradicate beliefs to which they cannot rationally assent. In formulating new beliefs, critical thinkers do not passively accept the beliefs of others; rather, they analyze issues themselves, reject unjustified authorities, and recognize the contributions of justified authorities. They thoughtfully form principles of thought and action; they do not mindlessly accept those presented to them. Nor are they unduly influenced by the language of another. If they find that a set of categories or distinctions is more appropriate than that suggested by another, they will use it. Recognizing that categories serve human purposes, they use those categories which best serve their purpose at the time. They are not limited by accepted ways of doing things. They evaluate both goals and how to achieve them. They do not accept as true, or reject as false, beliefs they do not understand. They are not easily manipulated.

Independent thinkers strive to incorporate all known relevant knowledge and insight into their thought and behavior. They strive to determine for themselves when information is relevant, when to apply a concept, or when to make use of a skill. They are self-monitoring: they catch their own mistakes; they don't need to be told what to do every step of the way.

Application

A critical education respects the autonomy of the student. It appeals to rationality. Students should be encouraged to discover information and use their knowledge, skills and insights to think for themselves. Merely giving students "facts" or telling them "the right way" to solve a problem interferes with students' critiquing and modifying pre-existing beliefs with new knowledge.

Rather than having students discuss only those ideas mentioned in their texts, the teacher can have them brainstorm ideas and argue among themselves, for instance, about problems and solutions.

Before reading a section of text that refers to a map, chart, time-line, or graph, students could examine and discuss it.

Students could develop their own categories instead of being provided with them. "Types of Literature" lessons could be remodelled so that students group and discuss writings they have read, entertaining different ways to classify them. Students can classify animals before reading zoological classification systems in their texts.

Rather than asking students to place objects into pre-existing categories, for instance, the teacher can encourage students to form their own categories. Students can then discuss the reasons they had for forming each cate-

gory. When different students have used different sets of categories to form groups, the teacher can ask such questions as: *When would this set of categories be most useful? When would that set be best? Why would someone else make different groupings?*

In math, instead of following directions in their texts, students can be given a task to perform or problem to solve in small groups. The class can then discuss their solutions and then compare them to what is in their text.

When a text tries to do too much of the students' thinking for them, it can be examined in depth. *"Why does the text tell you about this? Why do the authors think this (concept, skill, procedure, step) is worth knowing? Why does the text tell you to do this? What would happen if you didn't?"*

When giving written assignments, those assignments should provide many opportunities for the student to exercise independent judgment: in gathering and assembling information, in analyzing and synthesizing it, and in formulating and evaluating conclusions. Have students discuss how to organize their points in essays.

In science, students could put their own headings on charts or graphs they make, or decide what kind of graph would be most illuminating. Students can design their own experiments rather than follow directions in their texts.

Students could review material themselves, rather than relying on their texts for summaries and review questions. The teacher could routinely ask students, *"What are the most important points covered in the passage (chapter, story, etc.)?"* as a discussion beginner. The class could brainstorm about what they learned when studying a lesson, unit, or story. Only after they have exhausted their memories can the teacher try to elicit any crucial points neglected.

When discussing specific countries and periods of history, have students look at and discuss some combination of political, population distribution, physical, historical, linguistic, or land use maps before reading their texts. *"What can we tell about this country by looking at this map? What areas does it have? What kind of climate? Where do most of the people live? Why do you think they might live there? Where is the land easier to live on? Could that be why so many people live there? What languages do they speak? Who else in the world speaks that language? What can we infer from the fact that these people speak the same language as those over there? Were they in contact with each other at some point? What countries surround this country? What do we know about those countries? Judging by the physical map, would there have been much travel between this country and that, or would travel have been hard?* After students have made educated guesses, the class could discuss how they could verify their predictions. Groups of students could be assigned specific points to research. After studying their texts and hearing the results of the research, students could review the points made in this discussion, distinguishing things they were able to figure out from what they didn't know and what they were wrong about, so that the next time their predictions can be better qualified.

S-2 Developing Insight into Egocentricity or Sociocentricity

Principle

Egocentricity is the confusion of immediate perception with reality. It manifests itself as an inability or unwillingness to consider others' points of view, to accept ideas or facts which would conflict with gratification of desire. In the extreme, it is characterized by a need to be right about everything, a lack of interest in consistency and clarity, an all or nothing attitude ("I am 100% right; you are 100% wrong."), and a lack of self-consciousness of one's own thought processes. The egocentric individual is more concerned with the *appearance* of truth, fairness, and fairmindedness, than with actually *being* correct, fair, or fairminded. Egocentricity is the opposite of critical thought.

As people are socialized, egocentricity partly evolves into sociocentricity. Egocentric identification extends to groups. The individual goes from *"I* am right!" to *"We* are right!" To put this another way, people find that they can often best satisfy their egocentric desires through a group. "Group think" results when people egocentrically attach themselves to a group. One can see this in both children and adults: My daddy is better than your daddy! My school (religion, country, race, etc.) is better than yours.

If egocentricity and sociocentricity are the disease, self-awareness is the cure. In cases in which their own egocentric commitments are not supported, few people accept another's egocentric reasoning. Most can identify the sociocentricity of members of opposing groups. Yet when we are thinking egocentrically or sociocentrically, it seems right to us (at least at the time). Our belief in our own rightness is easier to maintain because we suppress the faults in our thinking. We automatically hide our egocentricity from ourselves. We fail to notice when our behavior contradicts our self-image. We base our reasoning on false assumptions we are unaware of making. We fail to make relevant distinctions of which we are otherwise aware, and able to make (when making such distinctions does not prevent us from getting what we want). We deny or conveniently "forget" facts inconsistent with our conclusions. We often misunderstand or distort what others say.

The solution, then, is to reflect on our reasoning and behavior; to make our assumptions explicit, critique them, and, when they are false, stop making them; to apply the same concepts in the same ways to ourselves and others; to consider every relevant fact, and to make our conclusions consistent with the evidence; and to listen carefully and openmindedly to those with whom we disagree. We can change egocentric tendencies when we see them for what they are: irrational and unjust. Therefore, the development of students' awareness of their egocentric and sociocentric patterns of thought is a crucial part of education in critical thinking.

Application

Although everyone has egocentric, sociocentric, and critical (or fairminded) tendencies to some extent, the purpose of education in critical thinking is to help students move away from egocentricity and sociocentricity, toward increasingly critical thought. Texts usually neglect obstacles to rationality, content to point out or have students point out irrationality and injustice. We recommend that students repeatedly discuss *why* people think irrationally and act unfairly.

The teacher can facilitate discussions of egocentric or sociocentric thought and behavior whenever such discussions seem relevant. Such discussions can be used as a basis for having students think about their own egocentric or sociocentric tendencies. The class can discuss conditions under which people are most likely to be egocentric and how egocentricity interferes with our ability to think and listen. By discussing what people think (and how they think) when they are being egocentric and sociocentric, students can begin to recognize common patterns of egocentric thought. The class can discuss some of the common false assumptions we all make at times (e.g., "Anyone who disapproves of anything I do is wrong or unfair. I have a right to have everything I want. Truth is what I want it to be. Different is bad. Our group (country, school, language, etc.) is better than any other.") Teachers can also have students point out the contradictions of egocentric attitudes. ("When I use something of yours without permission, it is 'borrowing'; when you use something of mine, it is 'stealing.' Taking something without asking is O.K. Taking something without asking is wrong.") Sometimes story characters illustrate egocentricity.

The most real and immediate form of sociocentricity students experience is in the mini-society of their peers. Student attitudes present a microcosm of the patterns which exist on a larger scale in societies. All of your students share some attitudes which are sociocentric. Furthermore, students divide themselves into "subcultures" or cliques, each of which is narrower than the school-wide "culture". Honest and realistic exploration of these phenomena allows students to clarify and evaluate the ways in which "group think" limits them.

Often texts attempt to discourage sociocentricity by encouraging tolerance — asking students to agree that people whose ways are different are not necessarily wrong. Yet, by keeping discussion general and not introducing specific advantages of different ways, students are left with a vague sense that they should be tolerant, rather than a clear sense that others have ways worth knowing about and learning from.

Some texts inadvertently foster sociocentricity by giving only the U.S. or European side of issues, treating rationalizations as truth, or presenting some groups in a distinctly negative light. The teacher could encourage students to recognize sociocentric bias, reconstruct and consider other views of current and historical issues, and discuss how to avoid thinking sociocentrically.

Texts include many subtle forms of sociocentricity, displaying a narrowly European or American perspective in word choice. For example, a society might be described as "isolated" rather than "isolated from contact with Europeans."

Before beginning study of another culture, the teacher could elicit students' ideas of that group, including stereotypes and misconceptions. Ask, *"What are these people like? What do you think of when you think of them? How have you seen them portrayed in movies and on T.V.?"* After study, students could evaluate these ideas in light of what they have learned, and why they had them. *"Remember what you said about these people before we studied them? Which of our original believes were false or misleading? Why did we think that way? Where did we get these ideas? How do people come to think they know what other people are like before they know anything about them? What false beliefs might other people have about us? Why?"*

S-3 Exercising Fairmindedness

Principle

To think critically about issues, we must be able to consider the strengths and weaknesses of opposing points of view; to imaginatively put ourselves in the place of others in order to genuinely understand them; to overcome our egocentric tendency to identify truth with our immediate perceptions or long-standing thought or belief. This trait correlates with the ability to reconstruct accurately the viewpoints and reasoning of others and to reason from premises, assumptions, and ideas other than our own. This trait also correlates with the willingness to remember occasions when we were wrong in the past despite an intense conviction that we were right, as well as the ability to imagine our being similarly deceived in a case at hand. Critical thinkers realize the unfairness of judging unfamiliar ideas until they fully understand them.

The world consists of many societies and peoples with many different points of view and ways of thinking. In order to develop as reasonable persons we need to enter into and think within the frameworks and ideas of different peoples and societies. We cannot truly understand the world if we think about it only from one viewpoint, as Americans, as Italians, or as Soviets.

Furthermore, critical thinkers recognize that their behavior affects others, and so consider their behavior from the perspective of those others.

Application

The teacher can encourage students to show reciprocity when disputes arise or when the class is discussing issues, evaluating the reasoning of story characters, or discussing people from other cultures.

When disputes naturally arise in the course of the day, the teacher can ask students to state one another's positions. Students should be given an opportunity to correct any misunderstanding of their positions. The teacher can

then ask students to explain why their fellow student might see the issue differently than they do. *"What is Sue angry about? Why does that make her mad? Sue, is that right?"*

Students can be encouraged to consider evidence and reasons for positions they disagree with, as well as those with which they agree. For example, have students consider positions from their parents' or siblings' points of view. *"Why doesn't your mother want you to ...? Why does she think it's bad for you (wrong, etc.)? What does she think will happen?"*

Rather then always having students argue their points of view, call on a student who doesn't have a position on the issue under discussion — that is still thinking things through. Help that student clarify the uncertainty. *"What makes sense about what each side said? What seems wrong? What aren't you sure about?"*

Although texts often have students consider a subject or issue from a second point of view, discussion is brief, rather than extended, and no attempt is made to have students integrate insights gained by considering multiple perspectives. If students write a dialogue about an issue from opposing points of view, or contrast a story character's reasoning with an opposing point of view, or role play discussions, the teacher can have them directly compare and evaluate different perspectives.

When the class is discussing different cultures the teacher can encourage students to consider *why* people choose to do things differently or why other people think their ways are best. For example, ask, *"What would be some advantages to arranged marriages? Why might some people prefer that system to ours? What problems would it solve or lessen?"*

Students can be reminded of, and analyze, times that many members of a group or the class contributed something toward finding or figuring out an answer, solving a problem, or understanding a complex situation.

The class can discuss how hard it sometimes can be to be fairminded.

S-4 Exploring Thoughts Underlying Feelings and Feelings Underlying Thoughts

Principle

Although it is common to separate thought and feeling as though they were independent opposing forces in the human mind, the truth is that virtually all human feelings are based on some level of thought and virtually all thought generative of some level of feeling. To think with self-understanding and insight, we must come to terms with the intimate connections between thought and feeling, reason and emotion. Critical thinkers realize that their feelings are their response (but not the only possible, or even necessarily the most reasonable response) to a situation. They know that their feelings would be different if they had a different understanding or interpretation of that situation. They recognize that thoughts and feelings, far from being dif-

ferent kinds of "things", are two aspects of their responses. Uncritical thinkers see little or no relationship between their feelings and their thoughts, and so escape responsibility for their thoughts, feelings, and actions. Their own feelings often seem unintelligible to them.

When we feel sad or depressed, it is often because we are interpreting our situation in an overly negative or pessimistic light. We may be forgetting to consider positive aspects of our life. We can better understand our feelings by asking ourselves "How have I come to feel this way? How am I looking at the situation? To what conclusion have I come? What is my evidence? What assumptions am I making? What inferences am I making? Are they sound inferences? Are there other possible ways to interpret this situation?" We can learn to seek patterns in our assumptions, and so begin to see the unity behind our separate emotions. Understanding oneself is the first step toward self-control and self-improvement. This self-understanding requires that we understand our feelings and emotions in relation to our thoughts, ideas, and interpretations of the world.

Application

Whenever a class discusses someone's feelings (such as that of a character in a story), the teacher can ask students to consider what the person might be thinking to have that feeling in that situation. *"Why does he feel this way? How is he interpreting his situation? What led him to that conclusion? Would you have felt the same if you had been in his circumstances? Why or why not? What accounts for the difference? What could he have thought instead? Then how might he have felt?"*

This strategy can be used in the service of developing an intellectual sense of justice and courage. Students can discuss the thoughts underlying passionate commitment to personal or social change. *"Why was she willing to do this? Was she scared? What else did she feel that helped her ignore her fears? Why? How did she look at things that helped her endure and stick with it?"*

Students can discuss reasons for greed, fear, apathy, and other negative or hampering feelings. *"Why are people greedy? What thoughts underlie greed? Why do people feel they need more money? What does less money mean to them? Why? What assumptions underlie these attitudes? To what further thoughts do these attitudes lead?"*

When discussing a case of mixed feelings, the teacher could ask, *"What was he feeling? What else? (Encourage multiple responses.) What led to this feeling? That one? Are these beliefs consistent or contradictory? How could someone have contradictory responses to one situation? Is there a way he could reconcile these contradictions?"*

Students can also generalize about thoughts behind various emotions: behind fear, thoughts like — "This is dangerous. I may be harmed;" behind anger, thoughts like — "This is not right, not fair;" behind indifference, thoughts like — "This does not matter, no one can do anything about this;" behind relief, thoughts like — "Things are better now. This won't bother me anymore."

S-5 Developing Intellectual Humility and Suspending Judgment

Principle

Critical thinkers recognize the limits of their knowledge. They are sensitive to circumstances in which their native egocentrism is likely to function self-deceptively; they are sensitive to bias, prejudice, and limitations of their views. Intellectual humility is based on the recognition that one ought not claim more than one actually knows. It does not imply spinelessness or submissiveness. It implies the lack of intellectual pretentiousness, arrogance, or conceit. It implies insight into the foundations of one's beliefs: knowing what evidence one has, how one has come to believe, what further evidence one might look for or examine.

Thus, critical thinkers distinguish what they know from what they don't know. They are not afraid of saying "I don't know" when they are not in a position to be sure. They can make this distinction because they habitually ask themselves, "How could one know whether or not this is true?" To say "In this case I must suspend judgment until I find out x and y," does not make them anxious or uncomfortable. They are willing to rethink conclusions in the light of new knowledge. They qualify their claims appropriately.

Application

Texts and testing methods inadvertently foster intellectual arrogance. Most text writing says, "Here's the way it is. Here's what we know. Remember this, and you'll know it, too." Behind student learning, there is often little more thought than "It's true because my textbook said it's true." This often generalizes to, "It's true because I read it somewhere."

Teachers can take advantage of any situation in which students are not in a position to know, to encourage the habit of exploring the basis for their beliefs. When materials call on students to make claims for which they have insufficient evidence, we suggest the teacher encourage students to remember what is said in the materials but also to suspend judgment as to its truth. The teacher might first ask for the evidence or reasons for the claim and have students probe its strength. Students can be encouraged to explain what they would need to learn in order to be more certain. You might have students consider how reasonable people respond to gossip or the news on T.V. They hear what is said, remember what they have heard, but do not automatically believe it.

In exposing students to concepts within a field, we can help students to see how all concepts depend on other, more basic concepts and how each field of knowledge is based on fundamental assumptions which need to be examined, understood, and justified. We can help students to discover experiences in their own lives which help support or justify what a text says. We should always be willing to entertain student doubts about what a text says.

We can model intellectual humility by demonstrating a willingness to admit limits in our own knowledge and in human knowledge generally. Routinely qualify statements: "I believe," "I'm pretty sure that," "I doubt," "I suspect," "Perhaps," "I'm told," "It seems," etc. This trait can be encouraged by frequent discussion in which ideas new to the students are explored for evidence and support.

Students should discuss such experiences as getting a bad first impression, then learning they were wrong; feeling certain of something, then later changing their minds; thinking they knew something, then realizing they didn't understand it; thinking they had the best or only answer or solution, then hearing a better one.

The teacher can have students brainstorm questions they have *after* study of a topic. Students could keep question logs during the course of research projects, periodically recording their unanswered questions. Thus, they can come to see for themselves that even when they have learned what is always expected of them, there is more to learn.

S-6 Developing Intellectual Courage

Principle

To think independently and fairly, one must feel the need to face and fairly deal with unpopular ideas, beliefs, or viewpoints. The courage to do so arises from the recognition that ideas considered dangerous or absurd are sometimes rationally justified (in whole or in part) and that conclusions or beliefs inculcated in us are sometimes false or misleading. If we are to determine for ourselves which is which, we must not passively and uncritically accept what we have "learned". We need courage to admit the truth in some ideas considered dangerous and absurd, and the distortion or falsity in some ideas strongly held in our social group. It will take courage to be true to our own thinking, for honestly questioning our deeply held beliefs can be difficult and sometimes frightening, and the penalties for non-conformity are often severe.

Application

Intellectual courage is fostered through a consistently openminded atmosphere. Students should be encouraged to honestly consider or doubt any belief. Students who disagree with or doubt their peers or text should be given support. The teacher should raise probing questions regarding unpopular ideas which students have hitherto been discouraged from considering. The teacher should model intellectual courage by playing devil's advocate. *Why does this idea bother you?*

Texts often seem to suggest that standing up for one's beliefs is fairly easy; they ignore the difficulty of "doing the right thing." Students could discuss such questions as these: *"Why is it hard to go against the crowd? If everyone around you is sure of something, why is it hard to question it or disagree?*

When is it good to do so? When might you hesitate? When should you hesitate? Is it hard to question your own beliefs? Why?"

Students who have been habitually praised for uncritically accepting others' claims may feel the rug pulled out from under them for a while when expected to think for themselves. Students should be emotionally supported in these circumstances and encouraged to express the natural hesitancy, discomfort, or anxiety they may experience so they may work their way through these feelings. A willingness to consider unpopular beliefs develops by degrees. Teachers should exercise discretion beginning first with mildly unpopular rather than with extremely unpopular beliefs.

If, during the course of the year, an idea or suggestion which at first sounded "crazy" was proven valuable, students can later be reminded of it, and discuss it at length, and compare it to other events. *"How did this idea seem at first? Why? What made you change your mind about it? Have you had other similar experiences? Why did those ideas seem crazy or stupid at first?"*

S-7 Developing Intellectual Good Faith or Integrity

Principle

Critical thinkers recognize the need to be true to their own thought, to be consistent in the intellectual standards they apply, to hold themselves to the same rigorous standards of evidence and proof to which they hold others, to practice what they advocate for others, and to honestly admit discrepancies and inconsistencies in their own thought and action. They believe most strongly what has been justified by their own thought and analyzed experience. They have a commitment to bringing the self they are and the self they want to be together. People in general are often inconsistent in their application of standards once their ego is involved positively or negatively. When people like us, we tend to over-estimate their positive characteristics; when they dislike us, we tend to underrate them.

Application

Texts often inadvertently encourage the mental split between "school belief" and "real life" belief and between verbal or public belief and belief that guides action. There is an old saying to the effect that "They are good prophets who follow their own teachings." And sometimes parents say, "Do as I say, not as I do." There is often a lack of integrity in human life. Hypocrisy and inconsistency are common. As educators, we need to highlight the difficulties of being consistent in an often inconsistent world.

As teachers, we need to be sensitive to our own inconsistencies in the application of rules and standards, and we need to help students to explore their own. Peer groups often pressure students to judge in-group members less critically than out-group members. Students need opportunities to honestly assess their own participation in such phenomena.

Texts often preach. They unrealistically present moral perfection as easy when it is often not. They ask general and loaded questions ("Do you listen to other views? Is it important to treat others fairly?") to which students are likely to simply respond with a "Yes!" Such questions should be remodelled and the "dark side" explored. For example, ask, *"When have you found it difficult to listen to others?"* or *"Why are people often unfair?"*

Language Arts texts sometimes have students roundly criticize characters without taking into account the difficulties of living up to worthy ideals. Students should be encouraged to give more realistic assessments. *"Would you have done otherwise? Would it have been easy? Why or why not? Why do so few people do this?"*

Social studies texts are harsher judges of other societies than of ours. Students should evaluate their texts' consistency in evaluation. The teacher may have to help students to recognize this problem.

When evaluating or developing criteria for evaluation, have students assess both themselves and others, noting their tendency to favor themselves.

S-8 Developing Intellectual Perseverance

Principle

Becoming a more critical thinker is not easy. It takes time and effort. Critical thinking is reflective and recursive; that is, we often go back in our thoughts to previous problems to re-consider or re-analyze them. Critical thinkers are willing to pursue intellectual insights and truths in spite of difficulties, obstacles, and frustrations. They recognize the need to struggle with confusion and unsettled questions over an extended period of time in order to achieve deeper understanding and insight. They recognize that significant change requires patience and hard work. Important issues often require extended thought, research, struggle. Considering a new view takes time. Yet people are often impatient to "get on with it" when they most need to slow down and think carefully. People rarely define issues or problems clearly; concepts are often left vague; related issues are not sorted out, etc. When people don't understand a problem or situation, their reactions and solutions often compound the original problem. Students need to gain insight into the need for intellectual perseverance.

Application

Intellectual perseverance can be developed by reviewing and discussing the kinds of difficulties that were inherent in previous problems worked on, exploring why it is necessary to struggle with them over an extended period.

Studying the work of great inventors or thinkers through biography can also be of use, with students discussing why long-range commitment was necessary. In time, students will see the value in pursuing important ideas at length.

Texts discourage this trait by doing too much for students: breaking processes into proceduralized fragments and drilling the fragments. Texts try to remove all struggle from learning. Students should come to see mental struggle as crucial to learning by discovering its reward in genuine understanding. Texts often present knowledge and knowledge acquisition (for example, scientific conclusions) as simple ("this experiment proved"), rather than the result of much thought, work, dead ends, etc.

Students should have some experiences slowly reading difficult material. Prove to them that if they are careful and stick to it, examining it one word, phrase, and sentence at a time, they can master it. Such in-depth reading can be done as a class, sentence by sentence, with students interpreting and explaining as they go.

Students with hobbies, skills, or interests could discuss how they learned about them, their mistakes, failures, and frustrations along the way, and the tenacity their mastery required.

Raise difficult problems again and again over the course of the year. Design long-term projects for which students must persevere. Of course, it is important to work with students on skills of breaking down complex problems into simpler components, so that they will see how to attack problems systematically.

Students can discuss experiences they have had wherein they came to understand something that at first baffled them, or seemed hopelessly confusing and frustrating. *"What was it like to not understand or be able to do it? How did you come to understand it? What was that like? Was it worth it? Did it seem worth it at the time? What made you change your mind?"*

Texts will sometimes say of a problem that it is hard to solve, and leave it at that. This encourages an "Oh, that's very complicated. I'll never get it." attitude antithetical to the critical spirit. Life's problems are not divided into the simple and the hopeless. To help students develop the sense that they can begin to attack even complex problems, you could divide the class into groups and have them discuss various ways in which the problem could be approached, seeing if they can break the problem down into simpler components. It is important to devote considerable time to problem analysis, in order to develop student confidence in their ability to distinguish hard from easy problems and to recognize when a longer term commitment will be necessary. Students will not develop intellectual perseverance unless they develop confidence in their ability to analyze and approach problems with success. You should not overwhelm students with the task of *solving* problems so difficult that they have little hope of making progress, nevertheless, they should be expected to make some progress toward understanding and sorting out complexities.

Take a basic idea within a subject ("well-written," "justice," "culture," "life," "matter," etc.). Have students write their ideas on it and discuss them. Every month or so, have them add to, revise, or write another paper. At the end of the year, they can assess the changes in their understanding from repeated consideration over the course of the year, graphically illustrating their own progress and development achieved through perseverance.

For students to recognize the need for further study of an idea, they need to have some sense of how their present knowledge is limited. Presenting some problems that are beyond their knowledge can be useful, if the class can come to see what they would have to learn to solve them. In this context, students can successfully uncover what they don't know, thereby fostering intellectual humility as well as laying the foundation for intellectual perseverance.

Illustrate how getting answers is not the only form of progress, show students how having better, clearer questions is also progress. Point out progress made. Sympathize with students' natural frustration and discouragement.

Have students discuss the importance of sufficient thought regarding significant decisions and beliefs, and the difficulty of becoming rational and well-educated, fairminded people.

When study and research fail to settle key questions, due to the inadequacy of available resources, the class could write letters to appropriate faculty of one or two colleges. Have students describe their research and results and pose their unanswered questions. The teacher may have to explain the replies. Students can then reopen the issues for further, better-informed discussion.

S-9 Developing Confidence in Reason

Principle

The rational person recognizes the power of reason and the value of disciplining thinking in accordance with rational standards. Virtually all of the progress that has been made in science and human knowledge testifies to this power, and so to the reasonability of having *confidence* in reason. To develop this faith is to come to see that ultimately one's own higher interests and those of humankind at large will be served best by giving the freest play to reason, by encouraging people to come to their own conclusions through a process of developing their own rational faculties. It is to believe that, with proper encouragement and cultivation, people can develop the ability to think for themselves, to form reasonable points of view, draw reasonable conclusions, think coherently and logically, persuade each other by reason and, ultimately, become reasonable persons, despite the deep-seated obstacles in the native character of the human mind and in society as we know it. It is to reject force and trickery as standard ways of changing another's mind. This confidence is essential to building a democracy in which people come to genuine rule, rather than being manipulated by the mass media, special interests, or by the inner prejudices, fears, and irrationalities that so easily and commonly tend to dominate human mindsYou should note that the act of faith we are recommending is not to be blind but should be tested in everyday experiences and academic work. In other words, we should have confidence in reason, because reason works. Confidence in reason does not deny the reality of intuition; rather, it provides a way of distinguishing intuition from prejudice.

At the heart of this principle is the desire to make sense of the world, and the expectation that sense can be made. Texts often don't make sense to students, sometimes because what they say doesn't make sense, more often because students don't have opportunities to make sense out of what they are told. Being continually called upon to "master" what seems nonsensical undermines the feeling that one can make sense of the world. Many students, rushed through mountains of material, give up on this early. ("If I try to make sense of this, I'll never finish. Trying to really understand just slows me down.")

Application

As a teacher, you can model confidence in reason in many ways. Every time you show your students that you can make rules, assignments, and classroom activities *intelligible* to them so that they can see that you are doing things for well-thought-out reasons, you help them to understand why confidence in reason is justified. Every time you help them solve a problem with the use of their own thinking or "think aloud" through a difficult problem in front of them, you encourage them to develop confidence in reason. Every time you encourage them to *question* the reasons behind rules, activities, and procedures, you help them to recognize that we should expect *reasonability* to be at the foundation of our lives. Every time you display a patient willingness to hear their reasons for their beliefs and actions you encourage confidence in reason. Every time you clarify a standard of good reasoning, helping them to grasp *why* this standard makes sense, you help them to develop confidence in reason.

One reason students have little faith in reason is that they don't see reason being used in their everyday lives. Power, authority, prestige, strength, intimidation, and pressure are often used instead of reason. Students develop a natural cynicism about reason which educators should help them to overcome.

Texts often make knowledge acquisition seem mysterious, as though scholars have some sort of mystical mental powers. Make the reasoning behind what they study clear, and students will feel that knowledge and reason are within their grasp.

Give students multiple opportunities to try to persuade each other and you. Insist that students who disagree *reason* with each other, rather than using ridicule, intimidation, peer pressure, etc.

By beginning study of a new topic by discussing what they know about it, students can begin to realize that their initial knowledge is worthwhile. By allowing students to tackle problems and tasks on their own before explaining what to do, teachers help students experience the power of their own minds. By then showing them a better way that scholars have developed, students can see its superior power for themselves. Thus, as they learn, they can feel their minds grow.

Have students compare and contrast the following concepts: intimidate, convince, persuade, trick, brainwash.

S-10 Refining Generalizations and Avoiding Oversimplifications

Principle

It is natural to seek to simplify problems and experiences to make them easier to deal with. Everyone does this. However, the uncritical thinker often oversimplifies, and as a result misrepresents problems and experiences. What should be recognized as complex, intricate, ambiguous, or subtle is viewed as simple, elementary, clear, and obvious. For example, it is typically an oversimplification to view people or groups as *all good* or *all bad*, actions as *always right* or *always wrong,* one contributing factor as *the cause,* etc., and yet such beliefs are common. Critical thinkers try to find simplifying patterns and solutions, but not by misrepresentation or distortion. Making a distinction between useful simplifications and misleading oversimplifications is important to critical thinking.

One of the strongest tendencies of the egocentric, uncritical mind is to see things in terms of black and white, "all right" and "all wrong." Hence, beliefs which should be held with varying degrees of certainty are held as certain. Critical thinkers are sensitive to this problem. They understand the relationship of evidence to belief and so qualify their statements accordingly. The tentativeness of many of their beliefs is characterized by the appropriate use of such qualifiers as 'highly likely,' 'probably,' 'not very likely,' 'highly unlikely,' 'often,' 'usually,' 'seldom,' 'I doubt,' 'I suspect,' 'most,' 'many,' and 'some.'

Critical thinkers scrutinize generalizations, probe for possible exceptions, and then use appropriate qualifications. Critical thinkers are not only clear, but also *exact* or *precise.*

Application

Whenever students or texts oversimplify, the teacher can ask questions which raise the problem of complexity. For instance, if a student or text overgeneralizes, the teacher can ask for counter-examples. If a text overlooks factors by stating one cause for a problem, situation, or event, the teacher can raise questions about other possible contributing factors. If different things are lumped together, the teacher can call attention to differences. (*"Is this situation 'just like' that one? What are some differences?"*) If interconnected or overlapping phenomena are too casually separated, the teacher can probe overlaps or connections. If only one point of view is expressed, though others are relevant, the teacher can play devil's advocate, bringing in other points of view.

Texts grossly oversimplify the concept of "characterization" by having students infer character traits from one action or speech (and thus leave students with a collections of unintegrated, fragmented, contradictory snap

judgments, rather than a developed, consistent, complete understanding of characters). Students should analyze the whole character by considering the variety of attitudes, actions, and statements.

Texts often state such vague generalities as "People must work together to solve this problem." Such a statement glosses over complications which could be clarified in a discussion. *"Why don't people work together on this? How should they? Why? Why wouldn't this seemingly obvious solution work? So, what else must be done? How could these needs and interests be reconciled?"*

Among the most common forms of oversimplification found in social studies texts is that of vaguely expressed explanations. Students can better understand explanations and descriptions of historical events, and peoples' reactions to them, by considering offered explanations in depth. For example, a text says that citizens of a former colony resented the rule they lived under. Students could discuss questions like the following: *Why did they resent being ruled by others? What, exactly made them unhappy with their situation? How would we feel about being conquered and ruled? What consequences might arise from our being taken over? Why? How might we respond? Why? Why would a country want to rule another group? What would it get out of it? Why wouldn't they want to give it up? What do they say are their reasons for not giving it up? Why don't the people they rule accept those reasons? Was this group's treatment of that group consistent with those reasons?*

Another common form of oversimplification in history texts occurs when texts describe *"the"* reason or cause of present or historical situations. This treatment often serves texts' sociocentric bias when discussing the causes of wars in which the U.S. has been involved; the enemy bears total responsibility. Students have had a sufficient number of experiences with conflict to be able to see how sometimes both sides are partly to blame. By discussing these experiences, and drawing analogies, students can learn to avoid simple, pat, self-serving interpretations of events. *"Did the U.S. contribute to this situation? How? Why did they do this? What might they have done instead? What result might that have had? Was only one side to blame?"*

When discussing generalizations, the teacher could ask students for counter-examples. The class can then suggest and evaluate more accurate formulations of the claim. *"Is this always the case? Can you think of a time when an x wasn't a y? Given that example, how could we make the claim more accurate?"* ("Sometimes ...." "When this is the case, that happens ...." "It seems that...." "When this *and* that are *both* true, then ....)

The teacher can encourage students to qualify their statements when they have insufficient evidence to be certain. By asking for the evidence on which student claims are based and encouraging students to recognize the possibility that alternative claims may be true, the teacher can help students develop the habits of saying "I'm not sure," and of using appropriate probability qualifiers.

Analogies and models (for example, in science) simplify the phenomena they represent. The class can examine ways such analogies and models break down. *"In what ways is this a poor analogy? How does this model break down? Why?*

What accounts for the differences? What does that tell us about our subject? Could the analogy or model be improved? How? Why is that better?"

S-11 Comparing Analogous Situations: Transferring Insights to New Contexts

Principle

An idea's power is limited by our capacity to see its application. Critical thinkers' ability to use ideas mindfully enhances their ability to transfer ideas critically. They practice using ideas and insights by appropriately applying them to new situations. This allows them to organize materials and experiences in different ways, to compare and contrast alternative labels, to integrate their understanding of different situations, and to find fruitful ways to conceptualize novel situations. Each new application of an idea enriches our understanding of both the idea applied and the situation to which it is applied. True education provides for more than one way to organize material. For example, history can be organized in our minds by geography, chronology, or by such phenomena as repeated patterns, common situations, analogous "stories", the dynamics of various kinds of change, and so on. The truly educated person is not trapped by one organizing principle, but can take knowledge apart and put it together many different ways. Each way of organizing knowledge has some benefit.

Application

Critical teaching, focussing more on basic concepts than on artificial organization of material, encourages students to apply what they have just learned to different but analogous contexts. Using similar information from different situations makes explanations clearer, less vague. For example, a conflict in literature might parallel a war or political conflict. Economic relations between nations could be compared to the economy of a household. *"How would that dynamic explain this situation?"*

When students master a new skill, or discover an insight, they can be encouraged to use it to analyze other situations. Combine the strategy with independent thought by asking students to name, recall, or find analogous situations.

Students can find analogies between historical events or beliefs and present day actions and claims. Any parallel situations can be compared, and insights into each applied to the other. *"Given what we know about our own civil war, it's causes and results, what it was like, what can we say about this other country's civil war?" "Does anything said here about the beginning of this country tell us anything about the beginning of our own country? Vice versa?"*

When students have learned a scientific law, concept, or principle, they can enrich their grasp of it by applying it to situations not mentioned in the text. *"Is air like a liquid in this way?"* By exploring student understanding in

this way, teachers can also discover students' misunderstandings of what they just learned.

After an idea has been covered, it can be brought up again, when useful. For example, a passage mentions a U.S. soldier during the war with Mexico leading troops over desert on horseback. If students have discussed the principle that geography and technology affect history, they could be reminded of that insight, and discuss questions like the following: *How did the desert affect the cavalry march? Why? What other affects do deserts have on war? Have we talked about other deserts that were involved in war or war maneuvers? Compare deserts to other difficult terrain, like mountains. How would the desert have affected marching troops? What else could have affected such a march?*

S-12 Developing One's Perspective: Creating or Exploring Beliefs, Arguments, or Theories

Principle

The world is not given to us sliced up into categories with pre-assigned labels on them. There are always many ways to "divide up" and so experience the world. How we do so is essential to our thinking and behavior. Uncritical thinkers assume that their perspective on things is the only correct one. Selfish critical thinkers manipulate the perspectives of others to gain advantage for themselves. Fairminded critical thinkers learn to recognize that their own way of thinking and that of all other perspectives are some combination of insight and error. They learn to develop their point of view through a critical analysis of their experience. They learn to question commonly accepted ways of understanding things and avoid uncritically accepting the viewpoints of their peer groups or society. They know what their perspectives are and can talk insightfully about them. To do this, they must create and explore their own beliefs, their own reasoning, and their own theories.

Application

Perspective is developed through extended thought, discussion, and writing. Students who are unsure what to think can be given time to reflect and come to tentative conclusions. Students who have definite conclusions about the subject at hand can consider ideas from other perspectives, answer questions about what they think, or reflect on new situations or problems. Students can compare what they say they believe with how they act.

Texts rarely call upon students to thoughtfully react to what they read. Teachers can raise basic and important questions about what students learn, having them discover and discuss underlying principles in their thought.

One-to-one Socratic questioning may facilitate development of perspective, especially for students who think they've exhausted their ideas. This

strategy will also often coincide with evaluating actions and policies, arguments, or assumptions.

Students could explain how what they have learned has changed their thinking in some way. A written assignment could be used as an opportunity for a student to explore an idea in depth, and either come to conclusions, or clarify issues and concepts.

In general, we should look for opportunities to ask students what *they* believe, how *they* see things, what reasons seem most persuasive to *them*, what theory *they* think best explains what we are trying to explain, and so forth. We should look for occasions in which they can name and describe their own perspectives, philosophies, and ways of thinking.

Explore big questions, helping students integrate details from different lessons and try to come to grips with the world. *What things are most important in life? What's the difference between important and trivial? What are people like? What kinds of people are there? What's the difference between right and wrong? What is friendship?* During such discussions, raise points made during study, and have students relate their general ideas to specifics they have studied.

S-13 Clarifying Issues, Conclusions, or Beliefs

Principle

The more completely, clearly, and accurately an issue or statement is formulated, the easier and more helpful the discussion of its settlement or verification. Given a clear statement of an issue, and prior to evaluating conclusions or solutions, it is important to recognize what is required to settle it. And before we can agree or disagree with a claim, we must understand it clearly. It makes no sense to say "I don't know what you mean, but I deny it, whatever it is." Critical thinkers recognize problematic claims, concepts, and standards of evaluation, making sure that understanding precedes judgment. They routinely distinguish facts from interpretations, opinions, judgments, or theories. They can then raise those questions most appropriate to understanding and evaluating each.

Application

Teachers should encourage students to slow down and reflect before coming to conclusions. When discussing an issue, the teacher can ask students first, *"Is the issue clear? What do you need to know to settle it? What would someone who disagreed with you say?"* Students should be encouraged to continually reformulate the issue in light of new information. They should be encouraged to see how the first statement of the issue or problem is rarely best (that is, most accurate, clear, and complete) and that they are in a better position to settle a question *after* they have developed as clear a formulation as possible.

When discussing an issue, teachers can have students discuss such questions as,*"Do we understand the issue? Do we know how to settle it? Have we stated it fairly? (Does our formulation assume one answer is correct? Would everyone involved accept this as a fair and accurate statement of the issue?)*

Are the words clear? Do we have to analyze any concepts? Do we know when the key words and phrases apply and don't apply? Do we clearly understand how they apply to this case?

Does this question ask something about facts? About the meanings of words? Are we evaluating anything? What? Why? What criteria should we use in the evaluation?

What facts are relevant? How can we get the evidence we need? How would the facts be gathered? What would researchers have to do to conduct such a study? What problems would they face? How could those obstacles be surmounted?"

When a statement is unclear, the class can discuss such questions as, *"How can we know whether or not this is true? What would it be like for this claim to be true? False? Do we clearly understand the difference? What evidence would count for it? Against it? Are any concepts (words or phrases) unclear? What does it assume? What does it imply? What does its opposite imply? Is there a clearer way to say this? Is there a more accurate way to say this? Can it be rephrased? Do the different ways of putting it say the same thing? Why would someone agree? Disagree?"*

This strategy provides a way of remodelling lessons that focus on "Fact/Opinion," or which have vague passages of text.

To encourage students to distinguish fact from interpretation, the teacher could use questions like the following: *Does this description stick to the facts, or is reasoning or response included? Is this something that can be directly seen, or would you have to interpret what you saw to arrive at this statement? Is this how anyone would describe the situation, or would someone else see it differently? What alternative descriptions or explanations are there?* Students could then examine the assumptions, inferences, and theories underlying the alternatives.

S-14 Clarifying and Analyzing the Meanings of Words or Phrases

Principle

Critical, independent thinking requires clarity of thought. A clear thinker understands concepts and knows what kind of evidence is required to justify applying a word or phrase to a situation. The ability to supply a definition is not proof of understanding. One must be able to supply clear, obvious examples and use the concept appropriately. In contrast, for an unclear thinker, words float through the mind unattached to clear, specific, concrete cases. Distinct concepts are confused. Often the only criterion for the application of

a term is that the case in question "seems like" an example. Irrelevant associations are confused with what are necessary parts of the concept (e.g., "Love involves flowers and candlelight.") Unclear thinkers lack independence of thought because they lack the ability to analyze a concept, and so critique its use.

Application

There are a number of techniques the teacher can use for analyzing concepts. Rather than simply asking students what a word or phrase means, or asking them for a definition, the teacher can use one of the techniques mentioned below.

When introducing concepts, paraphrasing is often helpful for relating the new term (word or phrase) to ideas students already understand. The teacher can also supply a range of examples, allowing students to add to the list. The class should discuss the purposes the concepts serves. *Why are you learning this? When would it be useful to make this distinction? What does this concept tell us?*

When introducing or discussing a concept that is not within students' experience, the teacher can use analogies which relate the idea to one with which students are familiar. Students could then compare the concepts.

When discussing words or phrases with which students are familiar, we suggest that teachers have students discuss clear examples of the concept, examples of its opposite (or examples which are clearly not instances of the concept), and examples for which neither the word or its opposite are completely accurate (borderline cases). Have students compare the facts relevant to deciding when the term and its opposite apply. Students could also discuss the implications of the concept and why people make a distinction between it and its opposite. *"Give me examples of X and the opposite of X. Why is this an X? What is it about this that makes you call it an X? What are you saying about it when you call it that? Why would someone use this expression? Why would someone want to bring it to people's attention? What are the practical consequences of calling it that? How do we feel about or treat X's? Why?" (Do the same for the opposite.)* When discussing examples, always start with the clearest, most obvious, indisputable cases and opposite cases. Only when those have been examined at length, should discussion move to the more problematic, controversial, difficult, or borderline examples. *"Why is this case different from the others? Why do you kind of want to call it X? Why do you hesitate to call it X? What can we call this case?"*

When clarifying a concept expressed by a phrase rather than a single word, discuss cases in which the phrase applies, instead of merely discussing the individual words. For example, when clarifying the concept of a 'just law,' though a general discussion of 'justice' may be helpful, the more specific idea *'just law'* should be discussed and contrasted with its opposite.

For concepts that commonly have a lot of irrelevant associations, the teacher can have students distinguish those associations which are logically

related to the concept, from those which are not. Have the class brainstorm ideas associated with the term under discussion. *(What do you think of when you think of school?)* Then ask the students if they can imagine using the term for situations lacking this or that listed idea. *(If teachers and students gathered in a building to study, but there were no blackboard or desks, is it a school?)* Students may see that many of their associations are not part of the concept. They are left with a clearer understanding of what is relevant to the concept and will be less tempted to confuse mere association with it.

Whenever a text or discussion uses one term in more than one sense, the teacher can ask students to state how it is being used in each case or have students paraphrase sentences in which they occur. Then the teacher can ask students to generate examples in which one, both, or neither meaning of the term applies. For example, students could distinguish ordinary from scientific concepts of work and energy. The class could rephrase such seeming absurdities as "This solid table isn't solid," into "This table that I can't pass my hand through actually has lots of empty spaces in it."

When a text confuses two distinct concepts, students can clarify them. Students can distinguish concepts by discussing the different applications and implications of the concepts. *Can you think of an example of A that isn't B? What's the difference?* Students could rewrite passages, making them clearer. For example, a social studies text explains how 'consensus' means that everyone in the group has to agree to decisions. The teachers' notes then suggest discussion of an example wherein a group of children have to make a decision, so they vote, and the majority gets its way. The example, though intended to illustrate consensus, misses the point and confuses 'consensus' with 'majority rule.' The class could compare the two ideas, and so distinguish them. *"What did the text say 'consensus' means? What example does it give? Is this an example of everyone having to agree? What is the difference? How could the example be changed to illustrate the term?"*

S-15 Developing Criteria for Evaluation: Clarifying Values and Standards

Principle

Critical thinkers realize that expressing mere preference does not substitute for evaluating something. Awareness of the process or components of evaluating facilitates thoughtful and fairminded evaluation. This process requires developing and using criteria or standards of evaluation, or making standards or criteria explicit. Critical thinkers are aware of the values on which they base their judgments. They have clarified them and understand *why* they are values.

When developing criteria, critical thinkers should understand the object and purpose of the evaluation, and what function the thing being evaluated

is supposed to serve. Critical thinkers take into consideration different points of view when attempting to evaluate something.

Application

Whenever students are evaluating something — an object, action, policy, solution, belief — the teacher can ask students what they are evaluating, the purpose of the evaluation, and the criteria they used. With practice, students can see the importance of developing clear criteria and applying them consistently. When discussing criteria as a class or in groups, rational discussion, clarity, and fairmindedness are usually more important than reaching consensus.

The class could discuss questions like the following: *What are we evaluating? Why? Why do we need an X? What are X's for? Name or describe some good X's versus bad X's. Why are these good and those bad? What are the differences? Given these reasons or differences, can we generalize and list criteria? Can we describe what to look for when judging an X? What features does an X need to have? Why.*

Much of Language Arts instruction can be viewed as developing and clarifying criteria for evaluating writing. Students should continually evaluate written material and discuss their criteria. Specific points should be explained in terms of the values they support (such as clarity).

Students could relate the evaluation of governments to their perspectives on the purposes and functions of governments. During discussions in which they evaluate specific actions or policies of some government, they could relate their evaluations to this discussion of criteria and underlying values.

S-16 Evaluating the Credibility of Sources of Information

Principle

Critical thinkers recognize the importance of using reliable sources of information when formulating conclusions. They give less weight to sources which either lack a track record of honesty, are not in a position to know, or have a vested interest in the issue. Critical thinkers recognize when there is more than one reasonable position to be taken on an issue; they compare alternative sources of information, noting areas of agreement; they analyze questions to determine whether or not the source is in a position to know; and they gather further information where sources disagree. They recognize obstacles to gathering accurate and pertinent information. They realize that preconception, for example, influences observation — that we often see only what we expect to see and fail to notice things we aren't looking for.

Application

When the class is discussing an issue about which people disagree, the teacher can encourage students to check a variety of sources representing

different points of view. (Examining twenty sources representing the same point of view is worthless for teaching this principle.) This strategy can be used in history and news lessons.

The class can discuss the relevance of a source's past dependability, how to determine whether a source is in a position to know, and how motives should be taken into account when determining whether a source of information is credible. The teacher can ask the following questions: *Is this person in a position to know? What would someone need, to be in a position to know? Was this person there? Could he have directly seen or heard, or would he have to have* reasoned *to what he claims to know? What do we know about this person's expertise and experience? What experience would you need to have to be an expert? What must you have studied? What does he claim about this issue? Where did he get his information? Is there reason to doubt him?. Has he been reliable in the past? Does he have anything to gain by convincing others? Who commissioned this report? Why?*

To more fully explore the idea of expertise with respect to a particular topic, the teacher could ask,*"What subjects, perspectives, theories, what kinds of details, what sorts of analyses would someone need knowledge of, in order to develop a complete and fairminded view of this subject?"* (For example, if the subject is a political conflict, an expert would need to know the historical background of the groups, their cultures, religions, and world views — including, for example, how each group sees itself and the others, — the geography of the area, the economic system or systems under which the groups live, etc.)

Finally, the teacher can use examples from the students' personal experience (for instance, trying to determine who started an argument) and encourage students to recognize the ways in which their own motivations can affect their interpretations and descriptions of events.

S-17 Questioning Deeply: Raising and Pursuing Root or Significant Questions

Principle

Critical thinkers can pursue an issue in depth, covering germane aspects in an extended process of thought or discussion. When reading a passage, they look for issues and concepts underlying the claims expressed. They come to their own understanding of the details they learn, placing them in the larger framework of the subject and their overall perspective. They contemplate the significant issues and questions underlying subjects or problems studied. They can move between basic underlying ideas and specific details. When pursuing a line of thought, they are not continually dragged off the subject. They use important issues to organize their thought and are not bound by the organization given by another.

Application

Each of the various subject areas has been developed to clarify and settle questions peculiar to itself. (For example, history: How did the world come to be the way it is now?) The teacher can use such questions to organize and unify details covered in each subject. Perhaps more important are basic questions everyone faces about what people are like, the nature of right and wrong, how we know things, and so on. Both general and subject-specific basic questions should be repeatedly raised and used as a framework for organizing details.

Texts fail to develop this trait of pursuing root questions by presenting pre-formulated conclusions, categories, solutions, and ideals, by failing to raise crucial or thought-provoking issues (and so avoiding them), by suggesting a too-limited discussion of them, by mixing questions relevant to different issues or by pursuing their objectives in a confusing way. To rectify these problems, teachers need to provide opportunities for students to come to their own conclusions, construct their own categories, devise their own solutions, and formulate their own ideals. They need to raise thought-provoking issues, allow extended discussion of them and keep the discussion focussed, so that different issues are identified and appropriately addressed. The students, in turn, need to be clear about the objectives and to see themselves as accomplishing them in a fruitful way.

The class can begin exploration of an important topic, concept, or issue not discussed in any one place in their texts by looking it up in the table of contents, index, list of tables, etc. They can then divide up the task of reading and taking notes on the references. The class can then discuss their passages, and pose questions to guide further research using other resources, and share their findings. Each student could then write an essay pulling the ideas together.

Why do people go to war? What wars do you know about? What caused each? Why do people fight? Can we generalize from these cases?

What main concepts (distinctions, categories) are used in this subject? Why? Why is this distinction more important than that one?

When a class discusses rules, institutions, activities, or ideals, the teacher can facilitate a discussion of their purposes, importance, or value. Students should be encouraged to see institutions, for example, as a creation of people, designed to fulfill certain functions, not as something that is "just there." Thus, they will be in a better position, when they are adults, to see that it fulfills its goals. Or, for another example, ideals will be better understood as requiring specific kinds of actions, instead of being left as mere vague slogans, if the class examines their value.

When the text avoids important issues related to or underlying the object of study (such as moral implications), the teacher or students could raise them and discuss them at length. Students can go through the assigned material, and possibly other resources, using the chosen issue or issues to

organize the details, for example, making a chart or issue map. Socratic questioning, it should be noted, typically raises root issues.

When a lesson does raise important questions but has too few and scattered questions, the teacher can pull out, rearrange, and add to the relevant questions, integrating them into an extended and focussed, rather than fragmented, discussion. Students can begin study with one or more significant questions and list relevant details as they read.

S-18 Analyzing or Evaluating Arguments, Interpretations, Beliefs, or Theories

Principle

Rather than carelessly agreeing or disagreeing with a conclusion based on their preconceptions of what is true, critical thinkers use analytic tools to understand the reasoning behind it and determine its relative strengths and weaknesses. When analyzing arguments, critical thinkers recognize the importance of asking for reasons and considering alternative views. They are especially sensitive to possible strengths of arguments that they disagree with, recognizing the tendency of humans to ignore, oversimplify, distort, or otherwise unfairly dismiss them. Critical thinkers analyze questions and place conflicting arguments, interpretations, and theories in opposition to one another, as a means of highlighting key concepts, assumptions, implications, etc.

When giving or being given an interpretation, critical thinkers, recognizing the difference between evidence and interpretation, explore the assumptions on which it is based, and propose and evaluate alternative interpretations for their relative strength. Autonomous thinkers consider competing theories and develop their own theories.

Application

Often texts claim to have students analyze and evaluate arguments, when all they have them do is state preferences and locate factual claims, with very limited discussion. They fail to teach most techniques for analyzing and evaluating arguments. Texts that do address aspects of argument critique tend to teach such skills and insights in isolation, and fail to mention them when appropriate and useful. (See "Text Treatment of Critical Thinking and Argumentation," in the chapter, "Thinking Critically About Teaching: From Didactic to Critical Teaching".)

Instead of simply stating why they agree or disagree with a line of reasoning, students should be encouraged to place competing arguments, interpretations, or theories in opposition to one another. Ask, *"What reasons are given? What would someone who disagreed with this argument say?"* Students should then be encouraged to argue back and forth, and modify their positions in light of the strengths of others' positions.

Students can become better able to evaluate reasoning by familiarizing themselves with, and practicing, specific analytic techniques, such as making assumptions explicit and evaluating them; clarifying issues, conclusions, values, and words, developing criteria for evaluation; recognizing and pinpointing contradictions; distinguishing relevant from irrelevant facts; evaluating evidence; and exploring implications. (See the strategies addressing these skills.) After extended discussion, have students state their final positions. Encourage them to qualify their claims appropriately.

When learning scientific theories, students should be encouraged to describe or develop their own theories and compare them with those presented in their texts. Students can compare the relative explanatory and predictive powers of various theories, whenever possible testing predictions with experiments or research.

S-19 Generating or Assessing Solutions

Principle

Critical problem-solvers use everything available to them to find the best solution they can. They evaluate solutions, not independently of, but in relation to one another (since 'best' implies a comparison). They take the time to formulate problems clearly, accurately, and fairly, rather than offering a sloppy, half-baked description and then immediately leaping to solutions. They examine the causes of the problem at length. They have reflected on such questions as, "What makes some solutions better than others? What does the solution to this problem require? What solutions have been tried for this and similar problems? With what results?"

But alternative solutions are often not given, they must be generated or thought-up. Critical thinkers must be creative thinkers as well, generating possible solutions in order to find the best one. Very often a problem persists, not because we can't tell which available solution is best but because the best solution has not yet been made available — no one has thought it up yet. Therefore, although critical thinkers use all available information relevant to their problems, including solutions others have tried in similar situations, they are flexible and imaginative, willing to try any good idea whether it has been done before or not.

Fairminded thinkers take into account the interests of everyone affected by the problem and proposed solutions. They are more committed to finding the best solution than to getting their way. They approach problems realistically.

Application

When presenting problem-solving lessons or activities, texts tend to provide lists of problem-solving steps which unnecessarily limit the process. For example, texts rarely encourage students to consider how others solved or tried to solve the same or a similar problem. They generally make "describing

the problem" step one, without having students reformulate their descriptions after further examination. They do not suggest analysis of causes. Texts often break problem-solving into steps and have students memorize the steps. They then drill students on one or two steps. But students don't follow the process through. Thus, each step, practiced in isolation, has no meaning.

The best way to develop insight into problem-solving is to solve problems. If problems arise in the class — for example, if discussions degenerate into shouting matches — students should be assisted in developing and instituting their own solutions. If the first attempt fails or causes other problems, students should consider why and try again. Thus, they can learn the practical difficulties involved in discovering and implementing a workable solution.

We recommend first that the teacher have students state the problem, if that has not been done. Students should explore the causes at length, exploring and evaluating multiple perspectives. Encourage them to integrate the strong points within each view. As the process of exploring solutions proceeds, students may find it useful to reformulate the description of the problem.

Rather than simply asking students if a given solution is good, the teacher could encourage an extended discussion of such questions as, *"Does this solve the problem? How? What other solutions can you think of? What are their advantages and disadvantages? Are we missing any relevant facts? (Is there anything we need to find out before we can decide which solution is best?) What are the criteria for judging solutions in this case? (How will we know if a solution is a good one?) Why do people/have people behaved in the ways that cause the problem? Can you think of other cases of this problem or similar problems? How did the people involved try to solve them? What results did that have? Did they solve the problems? Could we use the same solution, or is our case different in an important way? How do the solutions compare with each other? Why? What are some bad ways of trying to solve the problem? What is wrong with them? Do any of these solutions ignore someone's legitimate concerns or needs? How could the various needs be incorporated? If this fact about the situation were different, would it change our choice of solutions? Why or why not?"*

Fiction often provides opportunities for analysis of problems and evaluation of solutions. Texts' treatments are often too brief, superficial, and unrealistic. They can be extended by having students clarify the problem and analyze solutions as described above.

History texts often provide opportunities for use of this strategy when they describe problems people or government attempted to solve, for instance, by passing new laws. Students can evaluate the text's statement of the problem and its causes, evaluate the solution tried, and propose and evaluate alternatives. Students should be encouraged to explore the beliefs underlying various choices of solutions.

For instance, ask, *"Why do these people favor this solution and those people that one? What does each side claim causes the problem? What does each perspective assume? What sort of evidence would support each perspective?*

What other perspectives can there be? Can the perspectives be reconciled? What is your perspective on this problem? Why?"

Social studies texts provide innumerable opportunities for exploring crucial problems. *"What problems do we have in our country or part of the country? Why? Who is involved in this? Who contributes? How? Why? Who's affected? How? Why? What should be done? Why? Why not do it? What could go wrong? What do other people think should be done? Why? How can we find out more about the causes of this? How can we find out what different people want? Can the wants be reconciled? How? Why not? What compromises are in order?"*

What does this passage say was the problem? The cause? Explain the cause. What other explanations are there? Evaluate the explanations. What else was part of the cause? What was the solution tried? (Action, law, set of laws, policy, amendment, revolt, etc.) What were the effects? Who was affected? Did it have the desired effects? Undesirable effects? What should have been done differently, or what should we do now to rectify the problems that action caused? Do we need the law (policy, etc.) now?

S-20 Analyzing or Evaluating Actions and Policies

Principle

Critical thinking involves more than analysis of reasoning; it includes analysis of behavior or policy and a recognition of the reasoning that that behavior or policy presupposes. When evaluating the behavior of themselves and others, critical thinkers are conscious of the standards they use, so that these, too, can become objects of evaluation. Critical thinkers examine the consequences of actions and recognize these as fundamental to the standards for assessing both behavior and policy.

Critical thinkers base their evaluations of behavior on assumptions to which they have rationally assented. They can articulate and rationally apply principles.

Application

The teacher can encourage students to raise ethical questions about actions and policies of themselves and others. Students can become more comfortable with the process of evaluating if they are given a number of opportunities to make and assess moral judgments: *Why did x do this? What reasons were given? Were they the real reasons? Why do you think so? What are the probable consequences of these actions? How would you feel if someone acted this way toward you? Why? What reasons were your evaluations based on? Might someone else use a different standard to evaluate? Why? Do you think the action was fair, smart, etc.? Why or why not?*

Too often history texts fail to have students evaluate the behavior and policies about which they read. Texts often assume that people's stated rea-

sons were their real reasons. Sometimes texts describe behavior inconsistent with the stated intentions, yet fail to have students discuss these inconsistencies. *"Why did that group or government say they took this action? What did they do? What result did they say they wanted? What results did it actually have? Who was helped? Hurt? Why? Is the stated reason consistent with that behavior? Was the reason they gave their real reason? Why do you think so?"*

Students should evaluate the behavior of important people of the past. Such evaluation can be enhanced by having interested students report on the long-term consequences of past actions and policies. Future citizens of a democracy need to develop their own sense of how leaders and countries should and shouldn't behave.

Students should also be called upon to generalize, to formulate principles of judgment. *What makes some actions right, others wrong? What rights do people have? How can I know when someone's rights are being violated? Why respect people's rights? Why be good? Should I live according to rules? If so, what rules? If not, how should I decide what to do? What policies should be established and why? What are governments supposed to do? What shouldn't they do?*

These generalizations can be further analyzed and tested by having students compare them to specific cases they have judged in previous lessons. *"Is this principle consistent with that judgment you made last week about (fictional character, historical or current event, etc.)?"*

S-21 Reading Critically: Clarifying or Critiquing Texts

Principle

Critical thinkers read with a healthy skepticism. But they do not doubt or deny until they understand. They clarify before they judge. They expect intelligibility from what they read, and do not mindlessly accept nonsense. They realize that everyone is capable of making mistakes and being wrong, including authors of textbooks. They also realize that, since everyone has a point of view, everyone sometimes leaves out some relevant information. No two authors would write the same book or write from exactly the same perspective. Therefore, critical readers recognize that reading a book is reading one limited perspective on a subject and that more can be learned by considering other perspectives. Critical readers ask themselves questions as they read, wonder about the implications of, reasons for, examples of, and meaning and truth of the material. They do not approach written material as a collection of sentences, but as a whole, trying out various interpretations until one fits all of the work, rather than ignoring or distorting statements that don't fit their interpretation.

Application

Students should feel free to raise questions about materials they read. When a text is ambiguous, vague, or misleading, teachers can raise such questions as, *"What does this passage say? What does it imply? Assume? Is it clear? Explain it. Does it contradict anything you know or suspect to be true? How do you know? How could you find out? Does this fit in with your experience? In what way? Why or why not? What might someone who disagreed with it say? Does the text leave out relevant information? Does it favor one perspective? Which? Why do you suppose it was written this way? How could we rewrite this passage to make it clearer, fairer, or more accurate?"*

In Language Arts, rather than simply using recall questions at the end of fictional selections, have students describe the plot. Thus, students must pull out the main parts and understand cause and effect while being checked for basic comprehension and recall. Don't forget that students should continually evaluate what they read. *"How good is this selection? Why? Is it well written? Why or why not? Is it saying something important? What? How does it compare with other things we've read? Are some parts better than others? Which? Why?"*

Students can evaluate unit, chapter, and section titles and headings in their texts. *"What is the main point in this passage? What details does it give? What ideas do those details support, elaborate on, justify? Is the heading accurate? Misleading? Could you suggest a better heading?"*

Often passages which attempt to instill belief in important U.S. ideals are too vague to give more than the vague impression that our ideals are important. Such passages typically say that the ideals are important or precious, that people from other countries wish they had them or come here to enjoy them, that we all have a responsibility to preserve them, and so on. Such passages could be reread slowly and deeply with much discussion.

The class could engage in deeper, critical reading by discussing questions like the following: *Why is this right important? How is this supposed to help people? Does not having this right hurt people? How? Why?*

Why would someone try to prevent people from voting or speaking out? How could they? Have you ever denied someone the right to speak or be heard? Why? Were you justified? Why or why not? What should you have done?

Why is this right precious? Why are these rights emphasized? Do you have other rights? Why doesn't the text (or Constitution) say that you have the right to eat pickles? What are the differences between that right and those mentioned?

Does everyone believe in this or want this? How do you know? Have you ever heard anyone say that tyranny is the best kind of government, or free speech is bad? Why?

Is there a basic idea behind all of these rights? Why does the text say people have this responsibility? How, exactly, does this help our country? Why do

some people not do this? What does it require of you? And how do you do that? Is it easy or hard? What else does it mean you should do?

The teacher could make copies of passages from several sample texts which cover the same material and have students compare and critique them.

Students can discuss their interpretations of what they read. Small groups of students can compare their paraphrases and interpretations and write better ones.

S-22 Listening Critically: The Art of Silent Dialogue

Principle

Critical thinkers realize that listening can be done passively and uncritically or actively and critically. They know that it is easy to misunderstand what is said by another and difficult to integrate another's thinking into our own. Compare speaking and listening. When we speak, we need only keep track of our own ideas, arranging them in some order, expressing thoughts with which we are intimately familiar: our own. But listening is more complex. We must take the words of another and translate them into ideas that make sense to us. We have not had the experiences of the speakers. We are not on the inside of their point of view. We can't anticipate, as they can themselves, where their thoughts are leading them. We must continually interpret what others say within the confines of our experiences. We must find a way to enter into their points of view, shift our minds to follow their trains of thought.

What all of this means is that we need to learn how to listen actively and critically. We need to recognize that listening is an art involving skills that we can develop only with time and practice. We need to learn, for example, that to listen and learn from what we are hearing, we need to learn to ask key questions that enable us to locate ourselves in the thought of another. We must practice asking questions like the following: "I'm not sure I understand you when you say ..., could you explain that further?" "Could you give me an example or illustration of this?" "Would you also say ...?" "Let me see if I understand you. What you are saying is .... Is that right?" "How do you respond to this objection?" Critical readers ask questions as they read and use those questions to orient themselves to what an author is saying. Critical listeners ask questions as they listen to orient themselves to what a speaker is saying: Why does she say that? What examples could I give to illustrate that point? What is the main point? How does this detail relate to the main point? That one? Is she using this word as I would, or somewhat differently? These highly skilled and activated processes are crucial to learning. We need to heighten student awareness of and practice in them as often as we can.

Application

The first and best way to teach critical listening is to model it. It is necessary that we actively and constructively listen to what students say, demon-

strating the patience and skill necessary to understand them. We should not casually assume that we know what they mean. We should not pass by their expressions too quickly. Students rarely take seriously their own meanings. They rarely listen to themselves. They rarely realize the need to elaborate or exemplify their own thoughts. And we are often in a position to help them to do so with facilitating questions that result from close, enquiring listening.

Secondly, students rarely listen carefully to what other students have to say. They rarely take each other seriously. We can facilitate this process with questioning interventions. We can say things like: "Joel, did you follow what Diane said? Could you put what she said in your own words?" Or we can say, "Richard, could you give us an example from your own experience of what Jane has said? Has anything like that ever happened to you?"

The success of Socratic questioning and class discussion depends upon close and critical listening. Many assignments are understood or misunderstood through word of mouth. We need to take the occasion of making an assignment an occasion for testing and encouraging critical listening. In this way, we will get better work from students, because in learning how to listen critically to what we are asking them to do, they will gain a clearer grasp of what that is, and hence do a better job in doing it. Students often do an assignment poorly, because they never clearly understood it in the first place.

Students can describe discussions, videotapes, or movies in writing, then compare their versions in small groups, trying to accurately reconstruct what they heard. Whenever possible, they should watch the piece a second time to verify their accounts or settle conflicting accounts of what they saw and heard.

While watching a movie or video, students can be asked to take notes. Afterward, students can compare and discuss their notes. A teacher could periodically stop a movie or video and have students outline the main point, and raise critical questions.

S-23 Making Interdisciplinary Connections

Principle

Although in some ways it is convenient to divide knowledge up into disciplines, the divisions are not absolute. Critical thinkers do not allow the somewhat arbitrary distinctions between academic subjects to control their thinking. When considering issues which transcend subjects, they bring relevant concepts, knowledge, and insights from many subjects to the analysis. They make use of insights into one subject to inform their understanding of other subjects. There are always connections between subjects (language and logic; history, geography, psychology, anthropology, physiology; politics, geography, science, ecology; math, science, economics). To understand, say, reasons for the American Revolution (historical question), insights from technology, geography, economics, and philosophy can be fruitfully applied.

Application

Reading and writing can and should be taught in conjunction with every subject. One way to teach reading during other subjects would be to have students who cannot answer questions about what they read skim their texts to find the answer. Teachers could also have students who misunderstood a sentence in their texts find it. Either the sentence was unclearly written, in which case, students could revise it, or the students didn't read carefully, in which case the class could discuss why the sentence does not mean what the students thought.

Any time another subject is relevant to the object of discussion, those insights can be used and integrated. Some teachers allot time for coverage of topics in different subjects so that the topic is examined from the perspective of several subjects (history, literature, art, music, science). Study of the news can combine with nearly every subject — language arts, social studies, math, geography, science, health, etc.

Socratic questioning can be used to make subject connections clear. The teacher can use discussion of students' issues and problems to show the importance of bringing insights from many subjects to bear.

The class could evaluate writing in their texts from a literary or composition standpoint. *"Given what you know about good writing, is this passage well written? Organized? Interesting? Why or why not? How can it be improved? Is the quote used evocative? To the point? How does it illustrate or enhance the point made?"*

Students can evaluate the psychological, sociological, or historical accuracy or sophistication of fiction and biography.

S-24 Practicing Socratic Discussion: Clarifying and Questioning Beliefs, Theories, or Perspectives

Principle

Critical thinkers are nothing if not questioners. The ability to question and probe deeply, to get down to root ideas, to get beneath the mere appearance of things, is at the very heart of the activity. And, as questioners, they have many different kinds of questions and moves available and can follow up their questions appropriately. They can use questioning techniques, not to make others look stupid, but to learn what they think, helping them develop their ideas, or as a prelude to evaluating them. When confronted with a new idea, they want to understand it, to relate it to their experience, and to determine its implications, consequences, and value. They can fruitfully uncover the structure of their own and others' perspectives. Probing questions are the tools by which these goals are reached.

Furthermore, critical thinkers are comfortable being questioned. They don't become offended, confused, or intimidated. They welcome good questions as an opportunity to develop a line of thought.

Application

Students, then, should develop the ability to go beyond the basic what and why questions that are found in their native questioning impulses. To do this, they need to discover a variety of ways to frame questions which probe the logic of what they are reading, hearing, writing, or thinking. They need to learn how to probe for and question assumptions, judgments, inferences, apparent contradictions, or inconsistencies. They need to learn how to question the relevance of what is presented, the evidence for and against what is said, the way concepts are used, the implications of positions taken. Not only do we need to question students, we also need to have them question each other and themselves.

Classroom instruction and activities, therefore, should stimulate the student to question and help make the students comfortable when questioned, so that the questioning process is increasingly valued and mastered. Questioning should be introduced in such a way that students come to see it as an effective way to get at the heart of matters and to understand things from different points of view. It should not be used to embarrass or negate students. It should be part of an inquiry into issues of significance in an atmosphere of mutual support and cooperation. We therefore recommend that teachers cultivate a habit of wondering about the reasoning behind students' beliefs and translating their musings into questions.

The teacher should model Socratic questioning techniques and use them often. Any thought-provoking questions can start a Socratic discussion. To follow up responses, use questions like the following: *Why? If that is so, what follows? Are you assuming that...? How do you know that? Is the point that you are making that... or, ...? For example? Is this an example of what you mean..., or this,...? Can I summarize your point as...? What is your reason for saying that? What do you mean when using this word? Is it possible that...? Are there other ways of looking at it? How else could we view this matter?* (For more questions, see the chapter on Socratic questioning.)

Immediately after Socratic discussion, students can write for five minutes, summarizing the key points, raising new questions, adding analysis, examples, or clarification. Later these notes could be shared and discussion continued.

To develop students' abilities to use Socratic questioning, the teacher could present an idea or passage to students and have them brainstorm possible questions. For instance, they could think of questions to ask story or historical characters or a famous person or personal hero on a particular subject.

Pairs of students can practice questioning each other about issues raised in study, trading the roles of questioner and questioned. The teacher may provide lists of possible initial questions and perhaps some follow-up questions. Students could also be allowed to continue their discussions another day, after they've had time to think. As students practice Socratic questioning, see it modeled, and learn the language, skills, and insights of critical thinking, their mastery of questioning techniques will increase.

The direction and structure of a Socratic discussion can be made clearer by periodically summarizing and rephrasing the main points made or by distinguishing the perspectives expressed. *"We began with this question. Some of you said _____, others _____. These arguments were given .... Joan recommended that we distinguish X from Y. We've reached an impasse on X because we can't agree about two contradictory assumptions,_____ and _____. We decided we would need to find out _____. So let's take up Y."*

To practice exploring the idea of illuminating and probing Socratic questioning, students could read and evaluate different kinds of interviews, categorizing the questions asked. They could then list probing follow-up questions that weren't asked, and share and discuss their lists. *Why would you ask this? How could that be followed up? What would that tell you?*

S-25 Reasoning Dialogically: Comparing Perspectives, Interpretations, or Theories

Principle

Dialogical thinking refers to thinking that involves a dialogue or extended exchange between different points of view, cognitive domains, or frames of reference. Whenever we consider concepts or issues deeply, we naturally explore their connections to other ideas and issues within different domains or points of view. Critical thinkers need to be able to engage in fruitful, exploratory dialogue, proposing ideas, probing their roots, considering subject matter insights and evidence, testing ideas, and moving between various points of view. When we think, we often engage in dialogue, either inwardly or aloud with others. We need to integrate critical thinking skills into that dialogue so that it is as fruitful as possible. Socratic questioning is one form of dialogical thinking.

Application

By routinely raising root questions and root ideas in a classroom setting, multiple points of view get expressed and the thinking proceeds, not in a predictable or straightforward direction, but in a criss-crossing, back-and-forth movement. We continually encourage the students to explore how what they think about x relates to what they think about y and z. This necessarily requires that students' thinking moves back and forth between their own basic ideas and those being presented by the other students, between their own ideas and those expressed in a book or story, between their own thinking and their own experience, between ideas within one domain and those in another, in short, between any two perspectives. This dialogical process will sometimes become dialectical. Some ideas will clash or be inconsistent with others.

What would someone who disagreed say? Why? How could the first respond? Why? Etc.

When texts give only one side of an issue or event, the teacher could have students discuss other views. *What did the other (character, group of people) think? Why? (Take specific statements from the text.) Would others see it this way? Would they use these words? How would they describe this? Why? What exactly do they disagree about? Why? What does X think is the cause? Y? Why do they differ?*

Students could list points from multiple perspectives for reference, then write dialogues of people arguing about the issues.

Texts approach teaching dialogical thinking by having students discuss perspectives other than that presented by their texts. Yet such discussion is simply tacked on; it is not integrated with the rest of the material. Thus, the ideas are merely juxtaposed, not synthesized. Rather than separate activities or discussions about different perspectives, the teacher can have students move back and forth between points of view. *"What do the environmentalists want? Why? Factory owners? Why? Workers? Why? Why do the environmentalists think the factory owners are wrong? How do the factory owners respond to that? ... What beliefs do the sides have in common? How would ecologists look at this dispute? Economists? Anthropologists?"*

S-26 Reasoning Dialectically: Evaluating Perspectives, Interpretations, or Theories

Principle

Dialectical thinking refers to dialogical thinking conducted in order to test the strengths and weaknesses of opposing points of view. Court trials and debates are dialectical in intention. They pit idea against idea, reasoning against counter-reasoning in order to get at the truth of a matter. As soon as we begin to explore ideas, we find that some clash or are inconsistent with others. If we are to integrate our thinking, we need to assess which of the conflicting ideas we will provisionally accept and which we shall provisionally reject, or which parts of the views are strong and which weak, or how the views can be reconciled. Students need to develop dialectical reasoning skills, so that their thinking not only moves comfortably between divergent points of view or lines of thought, but also makes some assessments in light of the relative strengths and weaknesses of the evidence or reasoning presented. Hence, when thinking dialectically, critical thinkers can use critical microskills appropriately.

Application

Dialectical thinking can be practiced whenever two conflicting points of view, arguments, or conclusions are under discussion. Stories and history lessons provide many opportunities. Dialectical exchange between students

in science classes enables students to discover and appropriately amend their preconceptions about the physical world.

The teacher could have proponents of conflicting views argue their positions and have others evaluate them. A dialogical discussion could be taped for later analysis and evaluation. Or the teacher could inject evaluative questions into dialogical discussion. *"Was that reason a good one? Why or why not? Does the other view have a good objection to that reason? What? And the answer to that objection? Does each side use language appropriately and consistently? To what evidence does each side appeal? Is the evidence from both sides relevant? Questionable, or acceptable? Compare the sources each side cites for its evidence. Which is more trustworthy? How can we know which of these conflicting assumptions is best? Is there a way of reconciling these views? The evidence? What is this side right about? The other side? Which of these views is strongest? Why?"*

S-27 Comparing and Contrasting Ideals with Actual Practice

Principle

Self-improvement and social improvement are presupposed values of critical thinking. Critical thinking, therefore, requires an effort to see ourselves and others accurately. This requires recognizing gaps between ideals and practice. The fairminded thinker values truth and consistency and, therefore, works to minimize these gaps. The confusion of facts with ideals prevents us from moving closer to achieving our ideals. A critical education strives to highlight discrepancies between facts and ideals, and proposes and evaluates methods for minimizing them. This strategy is intimately connected with "developing intellectual good faith."

Application

Since, when discussing our society, many texts consistently confuse ideals with facts, the teacher can use them as objects of analysis. Ask, *"Is this a fact or an ideal? Are things always this way, or is this statement an expression of what people are trying to achieve? Are these ideals yours? Why or why not? How have people attempted to achieve this ideal? When did they not meet the ideal? Why? What problems did they have? Why? How can we better achieve these ideals?"* Students could rewrite misleading portions of text, making them more accurate.

Sometimes this strategy could take the form of *avoiding oversimplification.* For example, when considering the idea that we in this country are free to choose the work or jobs we want, the teacher could ask, *"Can people in this country choose any job they want? Always? What, besides choice, might affect what job someone has or gets? Would someone who looked like a bum be hired as a salesman? Does this mean they don't have this freedom? Why or why not? What if there aren't enough openings for some kind of work? How can this claim be made more accurate?"*

The teacher can facilitate a general discussion of the value of achieving consistency of thought and action. Ask, *"Have you ever thought something was true about yourself but acted in a way that was inconsistent with your ideal? Did you see yourself differently then? Did you make efforts to change the behavior? Can anyone think of ways to be more consistent? Why is it often hard to be honest about yourself and the groups you belong to? Is it worth the pain?"*

Sometimes texts foster this confusion in students by asking questions to which most people want to answer yes, for example: Do you like to help others? Do you listen to what other people have to say? Do you share things? Since none of us always adheres to our principles (though few like to admit it) you might consider rephrasing such questions. For example, ask, *"When have you enjoyed helping someone? When not? Why? Did you have to help that person? When is it hard to listen to what someone else has to say? Why? Have you ever not wanted to share something? Should you have? Why or why not? If you didn't share, why didn't you?"*

Such discussion can also explore the rationalizations people use. *What were you thinking? Why? Did you know you shouldn't, or did it seem OK at the time? Why?*

Obviously, the more realistic are our ideals, the closer we can come to achieving them. Therefore, any text's attempt to encourage unrealistic ideals can be remodelled. For example, rather than assuming that everyone should always do everything they can for everyone anytime, allow students to express a range of views on such virtues as generosity.

When discussing a departure from ideals or theory, have students analyze and evaluate it. Students could write an essay in which they focus on one such point. *"How is this supposed to work in theory? Why? What result is that supposed to have? Why is that considered good? How does this really work? Why? What incorrect assumption is made in the theory? What reasons are there for accepting this as it is? For trying to make it closer to the ideal? Is the way we actually do this justified? Why or why not? If it isn't justified, how can we correct it?"*

Students who are learning about capitalism could discuss how ads affect the workings of supply and demand. *"If ads get people to buy things for irrelevant reasons, or by distorting the facts, then is it true that people tend to buy the best products at the lowest prices? How does this affect manufacturers? What if it's cheaper and more profitable to make better ads than to make products? How does that affect the economy? Productions? How might it affect salaries?*

S-28 Thinking Precisely About Thinking: Using Critical Vocabulary

Principle

An essential requirement of critical thinking is the ability to think about thinking, to engage in what is sometimes called "metacognition". One possi-

ble definition of critical thinking is the art of thinking about your thinking while you're thinking in order to make your thinking better: more clear, more accurate, more fair. It is precisely at the level of "thinking about thinking" that most critical thinking stands in contrast to uncritical thinking. Critical thinkers can analyze thought — take it apart and put it together again. For the uncritical, thoughts are "just there". "I think what I think, don't ask me why." The analytical vocabulary in the English language (such terms as 'assume,' 'infer,' 'conclude,' 'criteria,' 'point of view,' 'relevance,' 'issue,' 'elaborate,' 'ambiguous,' 'objection,' 'support,' 'bias,' 'justify,' 'perspective,' 'contradiction,' 'consistent', 'credibility,' 'evidence,' 'interpret,' 'distinguish') enables us to think more precisely about our thinking. We are in a better position to assess reasoning (our own, as well as that of others) when we can use analytic vocabulary with accuracy and ease.

Application

Since most language is acquired by hearing words used in context, teachers should try to make critical terms part of their working vocabulary.

When students are reasoning or discussing the reasoning of others, the teacher can encourage them to use critical vocabulary. New words are most easily learned and remembered when they are clearly useful.

When introducing a term, the teacher can speak in pairs of sentences: first, using the critical vocabulary, then, rephrasing the sentence without the new term, e.g., *"What facts are relevant to this issue? What facts must we consider in deciding this issue? What information do we need?"* The teacher can also rephrase students' statements to incorporate the vocabulary. *"Do you mean that Jane is assuming that ...?"*

When conducting discussions, participating students could be encouraged to explain the role of their remarks in the discussion: supporting a point, raising an objection, answering an objection, distinguishing concepts or issues, questioning relevance, etc. *"Why were you raising that point here? Are you supporting Fred's point or ...?"*

Students could look up and discuss sets of related critical vocabulary words, and discuss relationships among them, when each can be used, and for what purposes.

S-29 Noting Significant Similarities and Differences

Principle

Critical thinkers strive to treat similar things similarly and different things differently. Uncritical thinkers, on the other hand, often miss significant similarities and differences. Things superficially similar are often significantly different. Things superficially different are often essentially the same. It is only by developing our observational and reasoning skills to a high point that we become sensitized to significant similarities and differ-

ences. As we develop this sensitivity, it influences how we experience, how we describe, how we categorize, and how we reason about things. We become more careful and discriminating in our use of words and phrases. We hesitate before we accept this or that analogy or comparison.

We recognize the purposes of the comparisons we make. We recognize that purposes govern the act of comparing and determine its scope and limits. The hierarchy of categories biologists, for instance, use to classify living things (with Kingdom as the most basic, all the way down to sub-species) reflects biological judgment regarding which kinds of similarities and differences between species are the most important *biologically,* that is, which distinctions shed the most light on how each organism is structured and lives. To the zoologist, the similarities whales have to horses is considered more important than their similarities to fish. The differences between whales and fish are considered more significant than differences between whales and horses. These distinctions suit the biologists' purposes.

Application

Texts often call on students to compare and contrast two or more things — objects, ideas, phenomena, etc. Yet these activities rarely have a serious purpose. Merely listing similarities and differences has little value in itself. Rather than encouraging students to make such lists, these activities should be proposed in a context which narrows the range of pertinent comparisons and requires some *use* be made of them in pursuit of some specific goal. For example, if comparing and contrasting two cultures, students should use their understanding to illuminate the relationship between them, perhaps to explain factors contributing to conflict or war. Thus, only those points which shed light on the particular problem need be mentioned, and each point has implications to be drawn out and integrated into a broader picture.

"What does this remind you of? Why? How is it similar? Different? How important are the differences? Why? What does this tell us about our topic? How useful is that comparison? Can anyone think of an even more useful comparison?"

Students can compare models to what they represent, and so evaluate them. *How much is the model like the real thing? Unlike it? What doesn't the model show? Why not? Could it? How or why not? What parts do they both have? Do they have analogous parts? Why or why not? How important are the missing or extra parts? How like the original thing is this part? How is this model helpful? In what ways is it misleading? What do we have to keep in mind when we look at this model? How good is this model? How could it be improved?*

When comparing characters from literature, rather than simply listing differences, students should analyze and *use* their comparisons. *Why are they different? (personality, lives, problems, current situations)* Don't let students over-generalize from differences. Texts have students make sweeping state-

ments from one difference in attitude or action. Such differences may not reflect difference in character as much as differences in situation. Have students relate differences in characterization, to differences in perspective. Relate differences in feelings and behavior to differences in how characters see things. Relate all significant differences between characters to the theme.

S-30 Examining or Evaluating Assumptions

Principle

We are in a better position to evaluate any reasoning or behavior when all of the elements of that reasoning or behavior are made explicit. We base both our reasoning and our behavior on beliefs we take for granted. We are often unaware of these assumptions. It is only by recognizing them that we can evaluate them. Critical thinkers have a passion for truth and for accepting the strongest reasoning. Thus, they have the intellectual courage to seek out and reject false assumptions. They realize that everyone makes some questionable assumptions. They are willing to question, and have others question, even their own most cherished assumptions. They consider alternative assumptions. They base their acceptance or rejection of assumptions on their rational scrutiny of them. They hold questionable assumptions with an appropriate degree of tentativeness. Independent thinkers evaluate assumptions for themselves, and do not simply accept the assumptions of others, even those assumptions made by everyone they know.

Application

Teachers should encourage students to make assumptions explicit as often as possible — assumptions made in what they read or hear and assumptions they make. Teachers should ask questions that elicit the implicit elements of students' claims. Although it is valuable practice to have students make good assumptions explicit, it is especially important when assumptions are questionable. The teacher might ask, *"If this was the evidence, and this the conclusion, what was assumed?" or If this is what he saw (heard, etc.), and this is what he concluded or thought, what did he assume? ("He saw red fruit and said 'Apples!' and ate it." "He assumed that all red fruits are apples." or "He assumed that, because it looked like an apple, it was good to eat.")*

There are no rules for determining when to have students evaluate assumptions. Students should feel free to question and discuss any assumptions they suspect are questionable or false. Students should also evaluate good assumptions. Doing so gives them a contrast with poor assumptions.

The following are some of the probing questions teachers may use when a class discusses the worth of an assumption: *Why do people (did this person) make this assumption? Have you ever made this assumption? What could be assumed instead? Is this belief true? Sometimes true? Seldom true? Always*

false? (Ask for examples.) Can you think of reasons for this belief? Against it? What, if anything, can we conclude about this assumption? What would we need to find out to be able to judge it? How would someone who makes this assumption act?

S-31 Distinguishing Relevant From Irrelevant Facts

Principle

Critical thinking requires sensitivity to the distinction between those facts that are relevant to an issue and those which are not. Critical thinkers focus their attention on relevant facts and do not let irrelevant considerations affect their conclusions. Furthermore, they recognize that a fact is only relevant or irrelevant in relation to an issue. Information relevant to one problem may not be relevant to another.

Application

When discussing an issue, solution to a problem, or when giving reasons for a conclusion, students can practice limiting their remarks to facts which are germane to that issue, problem, or conclusion. Often students assume that all information given has to be used to solve a problem. Life does not sort relevant from irrelevant information for us. Teachers can encourage students to make a case for the pertinence of their remarks, and help them see when their remarks are irrelevant. *"How would this fact affect our conclusion? If it were false, would we have to change our conclusion? Why or why not? What is the connection? Why does that matter? What issue are you addressing? Are you addressing* this *issue or raising a new one?"*

Students could read a chapter of text or story with one or more issues in mind and note relevant details. Students could then share and discuss their lists. Students can then discover that sometimes they must *argue* for the relevance of a particular fact to an issue.

Another technique for developing students' sensitivity to relevance is to change an issue slightly and have students compare what was relevant to the first issue to what is relevant to the second. ("What *really* happened?" versus "What does X *think* happened?" Or *"Can* you do this?" versus *"Should* you do it?" Or "Which one *is* best?" versus "Which do people *think* is best?" Or "Is this *legal?"* versus "Is this *right?"* versus "Is this *convenient?")*

Students who disagree about the relevance of a particular point to the issue discussed, should be encouraged to argue its potential relevance, and probe the beliefs underlying their disagreement. *Why do you think it's relevant? Why do you think it isn't? What is each side assuming? Do these assumptions make sense?*

S-32 Making Plausible Inferences, Predictions, or Interpretations

Principle

Thinking critically involves the ability to reach sound conclusions based on observation and information. Critical thinkers distinguish their observations from their conclusions. They look beyond the facts, to see what those facts imply. They know what the concepts they use imply. They also distinguish cases in which they can only guess from cases in which they can safely conclude. Critical thinkers recognize their tendency to make inferences that support their own egocentric or sociocentric world views and are therefore especially careful to evaluate inferences they make when their interests or desires are involved. Remember, every interpretation is based on inference, and we interpret every situation we are in.

Application

Teachers can ask students to make inferences based on a wide variety of statements, actions, story titles and pictures, story characters' statements and actions, text statements, and their fellow students' statements and actions. They can then argue for their inferences or interpretations. Students should be encouraged to distinguish their observations from inferences, and sound inferences from unsound inferences, guesses, etc.

Sometimes texts will describe details yet fail to make or have students make plausible inferences from them. The class could discuss such passages. Or groups of students might suggest possible inferences which the class as a whole could then discuss and evaluate.

Teachers can have students give examples, from their experience, of making bad inferences, and encourage them to recognize situations in which they are most susceptible to uncritical thought. The class can discuss ways in which they can successfully minimize the effects of irrationality in their thought.

Science instruction all too often provides the "correct" inferences to be made from experiments or observations rather than having students propose their own. Sometimes science texts encourage poor inferences given the observation cited. Though the conclusion is correct, students should note that the experiment alone did not prove it and should discuss other evidence supporting it.

Students should interpret experiments, and argue for their interpretations. *What happened? What does that mean? Are there other ways to interpret our results? What? How can we tell which is best?*

S-33 Evaluating Evidence and Alleged Facts

Principle

Critical thinkers can take their reasoning apart in order to examine and evaluate its components. They know on what evidence they base their conclusions. They realize that unstated, unknown reasons can be neither communicated nor critiqued. They can insightfully discuss evidence relevant to the issue or conclusions they consider. Not everything offered as evidence should be accepted. Evidence and factual claims should be scrutinized and evaluated. Evidence can be complete or incomplete, acceptable, questionable, or false.

Application

When asking students to come to conclusions, the teacher should ask for their reasons. *"How do you know? Why do you think so? What evidence do you have?"* etc. When the reasons students supply are incomplete, the teacher may want to ask a series of probing questions to elicit a fuller explanation of student reasoning. *"What other evidence do you have? How do you know your information is correct? What assumptions are you making? Do you have reason to think your assumptions are true?"* etc.

When discussing their interpretations of written material, students should routinely be asked to show specifically on what in the book or passage they base that interpretation. The sentence or passage can then be clarified and discussed and the student's interpretation better understood and evaluated.

On what evidence is this conclusion based? Where did we get the evidence? Is the source reliable? How could we find out what other evidence exists? What evidence supports opposing views? Is the evidence sufficient or do we need more? Is there reason to question this evidence? What makes it questionable? Acceptable? Does another view account for this evidence?"

S-34 Recognizing Contradictions

Principle

Consistency is a fundamental — some would say the *defining* — ideal of critical thinkers. They strive to remove contradictions from their beliefs, and are wary of contradictions in others. As would-be fairminded thinkers they strive to judge like cases in a like manner. Perhaps the most difficult form of consistency to achieve is that between word and deed. Self-serving double standards are one of the most common problems in human life. Children are in some sense aware of the importance of consistency ("Why don't I get to do what they get to do?"). They are frustrated by double standards, yet are given little help in getting insight into them and dealing with them.

Critical thinkers can pinpoint specifically where opposing arguments or views contradict each other, distinguishing the contradictions from compatible beliefs, thus focussing their analyses of conflicting views.

Application

When discussing conflicting lines of reasoning, inconsistent versions of the same story, or egocentric reasoning or behavior, the teacher can encourage students to bring out both views and practice recognizing contradictions. *"What does each person say? Could both views be true? Why or why not? If one is true, must the other be false? Where, exactly, do these views contradict each other? On what do they agree?"*

Sometimes fiction illustrates contradictions between what people say and what they do. History texts often confuse stated reasons with reasons implied by behavior. They will often repeat the noble justification that, say, a particular group ruled another group for its own good, when they in fact exploited them. Students could discuss questions like the following: *What did they say? What did they do? Are the two consistent or contradictory? Why do you say so? What behavior would have been consistent with their words? What words would have been consistent with their behavior?*

When arguing opposing views, students should be encouraged to find points of agreement and specify points of dispute or contradiction. *"What is it about that view that you think is false? Do you accept this claim? That one? On what question does your disagreement turn? What, exactly, is it in this view that you doubt or disagree with?"*

The class can explore possible ways to reconcile apparent contradictions. *"Could someone hold both of these views? How might someone argue that someone can believe both?"*

S-35 Exploring Implications and Consequences

Principle:

Critical thinkers can take statements, recognize their implications (i.e., if x is true, then y must also be true) and develop a fuller, more complete understanding of their meaning. They realize that to accept a statement one must also accept its implications. They can explore both implications and consequences at length. When considering beliefs that relate to actions or policies, critical thinkers assess the consequences of acting on those beliefs.

Application

The teacher can ask students to state the implications of material in student texts, especially when the text materials lack clarity. The process can help students better understand the meaning of a passage. *"What does this imply/mean? If this is true, what else must be true? What were, or would be, the consequences of this action, policy, solution? How do you know? Why wouldn't this happen instead? Are the consequences desirable? Why or why not?"*

Teachers can have students explore the implications and consequences of their own beliefs. During dialogical exchanges, students can compare the implications of ideas from different perspectives and the consequences of accepting each perspective. *"How would someone who believes this act? What result would that have?"*