4 Strategies

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. Each strategy description concludes with a list of lesson plans in which we use the strategy for reference. If you aren't sure you understand the principle and how it can be taught, or want more examples of teaching it, or want to see it taught in context, you could look up some of the lessons and read a use of the strategy and (in many cases) justification for that use.

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.

Immediately after the application we provide a list of lesson plans in which the strategy is used.

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. The strategies and lessons should be used to illuminate each other. If puzzled by a remodel (ours or your own), see the strategies. If puzzled by a strategy, see the originals and our critiques and remodels for clarification. 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 think-

ing 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.

Before we explore the interdependence of the affective strategies, we shall present three versions of our strategies. The first will formally name them, the second will reduce them to their simplest beginnings, the third will express them as they might be expressed by Fairminded Fran. We hope these formulations will help make these strategies more intuitive.

Do not to spend too much time on the general formulations of what critical thinking is before moving to the level of particular strategies, since people tend to have trouble assimilating general concepts unless they are made accessible by concrete examples.

Strategy List: 35 Dimensions of Critical Thought

(Formally named)

A. 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

B. 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

C. 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

Strategy List: 35 Dimensions of Critical Thought

(Informally characterized)

A. We use teaching strategies that encourage our children to begin to develop the attitudes and values essential to critical thinking. As a result:

S-1 Our children begin to think for themselves.

S-2 Our children begin to notice when they are seeing things narrowly.
Our children begin to see when they are conforming to their peer group.

S-3 Our children begin to appreciate the point of view of others.

S-4 Our children begin to think about why they feel as they do.

S-5 Our children begin to notice when they really know something and when they merely believe without good reasons.

S-6 Our children begin to question what their peer group says and to speak up for what they believe.

S-7 Our children begin to live up to what they expect of others.

S-8 Our children begin to persevere in their tasks even when the work is difficult.

S-9 Our children begin to discover how powerful their minds are, how much they can figure out by thinking.

B. We use teaching strategies that encourage our children to begin to develop large scale critical thinking skills and abilities. As a result:

S-10 Our children begin to be more precise in what they say and to notice complexity.

S-11 Our children begin to apply what they are learning to diverse situations.

S-12 Our children begin to discover and develop their own points of view.

S-13 Our children begin to clarify problems and questions.

S-14 Our children begin to clarify what words mean.

S-15 Our children begin to discover standards for measuring or judging things.

S-16 Our children begin to discover when it makes sense to believe what they hear.

S-17 Our children begin to ask deeper questions.

S-18 Our children begin to analyze what they say and do.

S-19 Our children begin to develop solutions to their problems.

S-20 Our children begin to evaluate rules, policies, and behavior.

S-21 Our children begin to learn how to question as they read.

S-22 Our children begin to listen attentively and to ask questions that clarify what is said.

S-23 Our children begin to make connections between what they are learning in different subjects.

S-24 Our children begin to discover and ask different kinds of questions.

S-25 Our children begin to learn from working and talking with each other.

S-26 Our children begin to learn how to discuss differences in a more reasoned way.

C. We use teaching strategies that encourage our children to begin to develop some of the fine-grained critical thinking skills. As a result:

S–27 Our children begin to distinguish ideals from actual practice.

S–28 Our children begin to use critical thinking terms in their work and discussion.

S–29 Our children begin to notice significant similarities and differences and use comparison to learn.

S–30 Our children begin to examine and evaluate what they usually assume.

S–31 Our children begin to figure out what facts they need to consider and notice when they are distracted by facts that have nothing to do with it.

S–32 Our children begin to fill in missing pieces, notice what things mean beyond what they say, make reasonable predictions.

S–33 Our children begin to give reasons for their beliefs and learn how to judge details, evidence, and facts.

S–34 Our children begin to notice when two statements or beliefs contradict each other.

S–35 Our children begin to explore implications and consequences.

It should not be assumed that there is a universal standard for how fast teachers should proceed with the task of remodelling their lesson plans. A slow but steady evolutionary process is much more desirable than a rush job across the board.

Strategy List: 35 Dimensions of Critical Thought
(As They Might Be Explained by Fairminded Fran)

In the chapter "Making Critical Thinking Intuitive" we introduced three fictional characters whose way of thinking illustrated the distinction between uncritical thinking (Naive Nancy), weak sense critical thinking (Selfish Sam), and strong sense critical thinking (Fairminded Fran). Before you examine our more formal explanations of the 35 dimensions of critical thinking you might find it useful to examine the following summaries as they might be expressed by Fairminded Fran. It is our hope that students will begin to think in these ways as we foster their thinking and encourage them to become not only skilled but fairminded as well.

A. Affective Strategies

S-1 **thinking independently:** "I try to do my own thinking, to figure things out for myself. It's good to listen to others to find out what they're thinking, but you must always use your own thinking to decide who to believe and what to do."

S-2 **developing insight into egocentricity or sociocentricity:** "If I don't watch myself, I pay too much attention to what I want, and go along too quickly with what my friends say. I have to remember that everyone usually puts what they want first and believes what their friends believe. Just because I or my friends think something doesn't make it so."

S-3 **exercising fairmindedness:** "Whenever I disagree with someone I should try to look at things from their point of view. Maybe If I see why someone disagrees with me, I will find a reason to agree with at least part of what they are saying."

S-4 **exploring thoughts underlying feelings and feelings underlying thoughts:** "When I get angry or sad, I should think about why. Maybe I could change the way I am looking at things and then not be so angry or so sad after all."

S-5 **developing intellectual humility and suspending judgment:** "I shouldn't say things that I don't really know are true. Lots of things that people say aren't true. Even TV and books are sometimes wrong. I should always be willing to ask 'How do *you* know that? How do *I* know that?'"

S-6 **developing intellectual courage:** "I should be ready to speak up for what I think is right, even if it is not popular with my friends or the kids I am with. I should be courteous but I should not be afraid to think differently."

S-7 **developing intellectual good faith or integrity:** "I should be careful to practice what I preach. It is no good saying I believe in something if I don't really act on it."

S-8 **developing intellectual perseverance:** "It isn't always easy to solve problems. Sometimes you have to think for a long, long time to do it. Even though my mind gets tired, I must not give up too easily."

S-9 **developing confidence in reason:** "I know my head can figure things out, if I am willing to think logically, look for evidence, and accept only good reasons for things."

B. Cognitive Strategies — Macro-Abilities

S-10 **refining generalizations and avoiding oversimplifications:** "It's wrong to say 'everyone' when you only mean 'most', or 'no one' when you only mean 'just a few'. It's nice to make things simple, but not so simple that they're not true."

S-11 **comparing analogous situations: transferring insights to new contexts:** "Lots of things are like other things. Being lost in the city may be in some ways like being lost in your life. Maybe in both cases you need a map!"

S-12 **developing one's perspective: creating or exploring beliefs, arguments, or theories:** "It takes time to figure out what you really think, sometimes years! I should be ready to listen to what other people think and why. Then my own ideas can grow and grow."

S-13 **clarifying issues, conclusions, or beliefs:** "Often what people say is not as clear as they think. You should always be ready to say 'What do you mean?' or 'Could you explain that to me?'"

S-14 **clarifying and analyzing the meanings of words or phrases:** "Words are funny. Sometimes it sounds like you know them when you don't. Yesterday when my teacher asked me what 'democracy' meant, I thought I knew, but I found I couldn't explain it."

S-15 **developing criteria for evaluation: clarifying values and standards:** "If we are going to judge something as good or bad, we need a way to do it. But often we decide that something is good or bad and really don't know why we said so. People are funny!"

S-16 **evaluating the credibility of sources of information:** "We learn lots of things from other people, and from books and TV. But sometimes what we learn isn't so. We need to question what we hear people say and what we see on TV. Do they really know? Maybe and maybe not!"

S-17 **questioning deeply: raising and pursuing root or significant questions:** "My teacher often asks us questions that sound easy but aren't. The other day she asked us what a country is and it took us a lot of time to figure it out. I guess sometimes simple things aren't so simple."

S-18 **analyzing or evaluating arguments, interpretations, beliefs, or theories:** "The other day my brother and I argued about who should do the dishes. Finally we decided that we should do them together."

S-19 **generating or assessing solutions:** "It's interesting to try to solve problems. Sometimes there are even different ways to get the same job done."

S-20 **analyzing or evaluating actions or policies:** "I get mad when I am not allowed to do what my brother is allowed to do. My parents say it is because he is older than me, but sometimes I am not allowed to do what he did when he was my age. That's not fair!"

S-21 **reading critically: clarifying or critiquing texts:** "When I read I try to figure out exactly what is being said. Reading is like being a detective. You have to ask questions and look carefully for clues."

S-22 **listening critically: the art of silent dialogue:** "When I listen to someone, I ask myself whether I could repeat what they are saying and whether I could explain it to someone else. Sometimes I ask myself, 'Did anything like this ever happen to me?' This helps me see if I'm listening carefully."

S-23 **making interdisciplinary connections:** "I am finding out how I can use what I learn in one subject while I'm working on another. Lots of ideas work in different places."

S-24 **practicing Socratic discussion: clarifying and questioning beliefs, theories, or perspectives:** "I am finding out that you learn a lot more if you ask a lot of questions. I am also learning that there are different kinds of questions and that you can find out different things by asking them."

S-25 **reasoning dialogically: comparing perspectives, interpretations, or theories:** "It helps to talk to other kids when you are trying to learn. Sometimes they have good ideas, and sometimes it helps you to try to explain things to the other kids."

S-26 **reasoning dialectically: evaluating perspectives, interpretations, or theories:** "It even helps to talk to other kids who think differently from you. Sometimes they know things you don't and sometimes you find out that you need to think more before you make up your mind."

C. Cognitive Strategies — Micro-Skills

S-27 **comparing and contrasting ideals with actual practice:** "Lots of things we say we believe in, but then we don't do it. We say that everyone is equal but we don't give them an equal chance. We need to fix things so that we mean what we say and say what we mean."

S-28 **thinking precisely about thinking: using critical vocabulary:** "There are special words you can learn to help you talk about what goes on in your head. For example, inferences happen when you learn some things and decide other things because of that. Assumptions happen when you believe things without thinking about them. I try to watch my inferences and assumptions."

S-29 **noting significant similarities and differences:** "Sometimes it is important to see how alike things are that are different. Sometimes it is important to see how different things are that are alike. I always try now to see how things are both alike and different."

S-30 **examining or evaluating assumptions:** "To do a good job of thinking you have to pay attention to what you believe without thinking. Sometimes we go along with stuff without thinking about it. When you do, watch out! You probably missed something important!"

S-31 **distinguishing relevant from irrelevant facts:** "It may be true but is it related? We often forget to ask this. To figure things out you must stick to the point and not get other things mixed in."

S-32 **making plausible inferences, predictions, or interpretations:** "I sometimes decide things that aren't true. Then I have to stop and think about why I did that. I try to be more careful next time. Things often seem to be one way at the moment and then turn out to be different."

S-33 **giving reasons and evaluating evidence and alleged facts:** "Detectives and police look carefully for evidence so they can find out who really did it. We need to find evidence too, when we read and write and talk. We should try to find evidence before we decide who is right and wrong."

S-34 **recognizing contradictions:** "Sometimes kids say one thing today and another thing tomorrow. Sometimes parents and teachers do, too. That's confusing. You should decide what you really mean and then stick to it and not go back and forth and back and forth."

S-35 **exploring implications and consequences:** "When things happen, other things happen because of them. If you say something mean to someone, they may feel bad for a long, long time. It's important to see that, otherwise we won't notice all the things we are making happen."

How Would Naive Nancy and Selfish Sam Understand the Strategies ?

It should be clear that Naive Nancy and Selfish Sam would give different explanations of the 35 dimensions of critical thought. Nancy would deceive herself into thinking that she was thinking critically when she was not. Furthermore, most of her understandings would be so abstract that she would not be able to apply the principles to her experience. Selfish Sam would emphasize the usefulness of the various dimensions of critical thinking for getting what he wants, for protecting himself, and for using others to his advantage. However, he would show little interest in the principles that focus on fairmindedness, intellectual humility, and integrity.

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 from 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 over-all 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.

Important 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. You can find many grade level examples of the applications in the remodeled lesson plan section of the book.

S-1 Thinking Independently

Principle: Critical thinking is independent 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 praised or rewarded for believing). Critical thinkers use critical skills and insights to reveal and reject beliefs that are irrational. In forming new beliefs, critical thinkers do not passively accept the beliefs of others; rather, they try to figure things out for themselves, reject unjustified authorities, and recognize the contributions of genuine 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 used 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. Children should be encouraged to discover information and use their knowledge, skills, and insights to think for themselves. Merely giving children "facts" or telling them "the right way" to solve a problem interferes with their questioning and replacing pre-existing beliefs with new knowledge.

Rather than asking children to place objects or pictures into pre-existing categories, the teacher can allow children to form their own categories. They can then discuss the reasons they had for forming each category. When different children have used different sets of categories to form groups, the teacher can ask such questions as these: *"When would it be best to group things this way? When would that way be best? Why would someone else make different groupings?"*

"Types of Literature" lessons could be remodelled so that children group and discuss writings they have read, entertaining different ways to classify them: *"Is this story like any other stories you've heard or read? Which? Why is it like this one?"* Children could collect and sort pictures of animals. The teacher can point out how their categories are like and unlike scientific categories. Older children could list and classify animals before reading zoological classification systems in their texts.

Text questions often presuppose what should be questioned: *"Why is this a good story title? Why did this story character do the wrong thing?"* Such questions can be remodelled: *"Is this a good title? Should this character have done that?"* The children can then be asked to support their answers with reasons which could then be probed and evaluated.

Rather than having children discuss only those ideas mentioned in their texts, the teacher can first have them brainstorm ideas and argue among themselves, for instance, about problems and solutions. Then when they read the text, they can compare it with their own ideas.

Before reading a section of text that refers to a map, chart, picture, or graph, students could first examine and discuss it: *"What does this show us? How can you tell?"*

In math, instead of following directions in their texts, children can be given a task to perform or problem to solve in small groups. *"How many paper clips would it take to go from here to the principal's office?"* The class can then discuss their so-

lutions (and perhaps compare them to what is in their text). Younger children could figure out simple math problem through play-acting. *"Let's try to figure out the answer to 3 – 1. Let's have three of you stand here. Now, one of you walks away — that's 'minus one'. So what's left?"*

When a text tries to do too much of the children's thinking for them, the material 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 step? What would happen if you didn't? If you did it differently?"*

Similar questions can be asked of pre-readers when they have been given directions for an activity or project: *"Why have I asked you to do this? Why did I suggest you do this first? What would happen if we didn't do it this way? Is there another good way we could do this?"*

Writing assignments should provide many opportunities for the student to begin to exercise independent judgment — by gathering and assembling information, by thinking about it, or by coming up with conclusions. The students can also discuss how to express and organize their thoughts in sentences and paragraphs.

In science, children could put their own headings on charts or graphs they make, or decide what kind of graph would be most helpful. They can design their own experiments rather than follow directions in their texts. *"How could we find out? What could we do? What would that tell us?"* Rather than reading their texts' account of what an experiment or study proved, the students can be asked what *they* think it means.

Children 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 should the teacher try to elicit any crucial points they neglected.

Lesson plans in which the strategy is used

S-2 Developing Insight Into Egocentricity or Sociocentricity

Principle: Egocentricity means confusing what we see and think with reality. When under the influence of egocentricity, we think that the way we see things is exactly the way things are. Egocentricity manifests itself as an inability or unwillingness to consider others' points of view, a refusal to accept ideas or facts which would prevent us from getting what we want (or think we want). In its extreme forms, 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. It is common in adults as well as in children.

As people are socialized, egocentricity partly evolves into sociocentricity. Egocentric tendencies extend to their 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. Uncritical thinkers often confuse loyalty with always supporting and agreeing, even when the other person or the group is wrong.

If egocentricity and sociocentricity are the disease, self-awareness is the cure. We need to become aware of our own tendency to confuse our view with "The Truth". People can often recognize when someone else is egocentric. Most of us can identify the sociocentricity of members of opposing groups. Yet when we ourselves 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 ignore 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 them prevents us from getting what we want. We deny or conveniently "forget" facts that do not support our conclusions. We often misunderstand or distort what others say.

The solution, then, is to reflect on our reasoning and behavior; to make our beliefs 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 others. We can change egocentric tendencies when we see them for what they are: irrational and unjust. The development of children's awareness of their egocentric and sociocentric patterns of thought is a crucial part of education in critical thinking. This development will be modest at first but can grow considerably over time.

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 children point out irrationality and injustice. We recommend that children repeatedly discuss *why* people think irrationally and act unfairly. *"Why did he do that? What was he thinking? Why?"*

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 the children think about their own egocentric or sociocentric tendencies. The class can discuss situations in 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, children 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. Anyone who is different is bad. Our group (country, school, language, etc.) is better than any other."] Teachers can also have children point out the contradictions of egocentric attitudes: ["When I use something of yours without asking first, it is 'borrowing'; when you use something of mine, it is 'stealing'. Taking something without asking is O.K. (when I do it). Taking something without asking is wrong (when you do it)."] Sometimes story characters illustrate egocentricity.

The most real and immediate form of sociocentricity children experience is in the mini-society of their peers. Student attitudes present a small-scale version of the patterns which exist on a larger scale in societies. All of your students share some attitudes which are sociocentric. Furthermore, children divide themselves into "sub-cultures", each of which is narrower than the school-wide "culture". Honest and realistic exploration of these phenomena allows children to clarify and evaluate the ways in which "group think" limits them. *"What happens when I go along with my friends, even when I really don't want to? Should I always think the same as my friends?"*

Often texts try to discourage sociocentricity by encouraging tolerance — asking children 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, children 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.

The standard approach to combatting sociocentricity and stereotyping usually fails to address children's real beliefs. As a result, "school knowledge" simply becomes a veneer over students real beliefs. Before beginning study of other peoples, the teacher could elicit children's ideas of that group, including stereotypes and misconceptions: *"What are these people like? (What is this animal like?) What do you think of when you think of them? How do they act in movies and on T.V.?"* After study, the children could evaluate these ideas in light of what they have learned. They could also discuss why they had them: *"Remember what you said about these people before we studied them? Which of our original beliefs were false or misleading? Why did we think that? Where did we get those ideas?"*

Lesson plans in which the strategy is used

S-3 Exercising Fairmindedness

Principle: To think critically, 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 is linked to the ability to accurately reconstruct the viewpoints and reasoning of others and to reason from premises, assumptions, and ideas other than our own. This trait also requires 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. 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 children to think fairmindedly 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 the children to state one another's positions. They should be given an opportunity to correct any misunderstanding of their positions. The teacher can then ask them to explain why their classmate might see the issue differently than they do. *"What is Sue angry about? Why does that make her mad? Sue, is that right?"*

Children can be encouraged to consider evidence and reasons for beliefs they disagree with, as well as those with which they agree. For example, have them 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? Why?"*

Rather than always having children argue their points of view, call on a student who doesn't have a position on the issue under discussion — who 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 them integrate insights gained by considering multiple perspectives. If children 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, they can directly compare and evaluate different perspectives.

Children 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.

Lesson plans in which the strategy is used

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 the situation. They recognize that thoughts and feelings, far from being different 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 lives. 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? Do my conclusions make sense? Are there other 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 ourselves 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 the class discusses someone's feelings (such as those of a character in a story), the teacher can ask children 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 or looking at his situation? (How does he see things? What does he think she meant?) What led him to that conclusion? (Why does he think that?) What could he have thought instead? Then how might he have felt?"*

This strategy can be used to help students begin to develop an intellectual sense of justice and courage. Children 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 overcome her fears? Why? How did she look at things that helped her endure or stick with it?"*

Children 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?"*

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? (Does it make sense to think all these things?) How could someone have opposite feelings about one situation? Is there a way he could reconcile these contradictions or make sense of these opposite feelings?"*

Children can also generalize about thoughts behind various emotions: behind fear, thoughts like — "This is dangerous. I may be hurt;" 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."

Lesson plans in which the strategy is used

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 egocentricity 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 should 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.

In exposing children to concepts within a field of knowledge, we can help them see how all concepts depend on other, more basic concepts and how each field is based on fundamental assumptions which need to be examined, understood, and justified. The class should often explore the connections between specific details and basic concepts or principles. We can help children 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.

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 the children are not in a position to know, to encourage the habit of exploring the basis for their beliefs. When materials call on the students to say or agree to what they are not in a position to know, we suggest the teacher encourage them 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 the children probe its strength. They can be encouraged to explain what they would need to learn in order to be more certain.

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.

Children can 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. *"Did you feel sure? Why? What made you change your mind? What does this tell us about feeling sure of things?"*

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

Lesson plans in which the strategy is used

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 when we see 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. 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. Children should be encouraged to honestly consider or doubt any belief. Children who disagree with or doubt their peers, teacher, or text should be allowed to explain their reasons. Teachers should raise probing questions regarding unpopular ideas which their students have hitherto been discouraged from considering. The teacher should model intellectual courage by playing devil's advocate.

To help students begin to discover the importance of intellectual courage, the class 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?"*

Children 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. They 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, the children can later be reminded of it, 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?"*

Lesson plans in which the strategy is used

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. For instance, 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 children to explore their own. Peer groups often pressure children to judge in-group members less critically than out-group members. Children 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 children 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 hard to listen to others?"* or *"Why are people often unfair?"*

Language Arts texts sometimes have children roundly criticize characters without taking into account the difficulties of living up to worthy ideals. Children 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?"*

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

Lesson plans in which the strategy is used

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 think back 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 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. Children 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 children discussing why long-range commitment was necessary. In time, children will see the value in pursuing important ideas at length.

Texts discourage this trait by doing too much for children: breaking processes into algorithmic fragments and drilling the fragments. Texts try to remove all struggle from learning. Children should begin 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.

Children should have some experiences slowly reading material they find difficult. Help them begin to see 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 or in small groups, sentence by sentence, with children interpreting and explaining as they go.

Children 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 that begin to develop perseverance. Of course, it is important to work with children on skills of breaking down complex problems into simpler components, so that they will see how to attack problems systematically.

Children 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? Did it seem worth it at the time? Was it worth it?"*

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 that prevents development of the critical spirit. Life's problems are not divided into the simple and the hopeless. To help children 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 and see if they can break the problem down into simpler components. Children will not develop intellectual perseverance unless they develop confidence in their ability to analyze and approach problems with success. You should not overwhelm children with the task of *solving* problems so difficult that they have little hope of making progress, nevertheless, they can be expected to make some progress toward understanding and sorting things out.

Take a basic idea within a subject ("good story," "fairness," "communities," "living things," etc.). Have the children write their ideas on it and discuss them. Every month or so, have them add to, revise, or write more. (Or have discussions and record the key points.) 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 through perseverance.

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

Have the children discuss the importance of giving sufficient thought to important decisions and beliefs, and the difficulty of becoming rational, 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 children describe their work and results and pose their unanswered questions. The teacher may have to explain the replies. Children can then reopen the issues for further, better-informed discussion.

Lesson plans in which the strategy is used

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 in reason is to come to see that ultimately one's own higher interests and those of humankind at large will best be served 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 reject force and trickery as standard ways of changing another's mind. 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 clearly 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. 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 dominate human minds.

You should note that the act of faith we are recommending is not blind faith, 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. When we know the source of our thinking and keep our minds open to new reason and evidence, we will be more likely to correct our prejudiced thought.

At the heart of this principle of faith in reason is the desire to make sense of the world and the expectation that sense can be made. Texts often don't make sense to children, sometimes because what they say doesn't make sense, more often because children aren't given time 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 children, 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. Nobody expects me to make sense of this; they just want me to do it.")

Application: As a teacher, you can model confidence in reason in many ways. Every time you show your children 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 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 help them develop confidence in reason. Every time you encourage them to *question* the reasons behind rules, activities, and procedures, you help them 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 develop confidence in reason.

One reason children 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. Many children develop a natural cynicism about reason which educators should help them overcome.

Critical education develops insight into the functions that various mechanical skills (such as use of grammar, sorting, counting, measuring, graphing) serve. Children need to learn, as early as possible, the relationship of human purposes to the function of such skills, and how they can be modified as human purposes change. Children will be more adept at using techniques and skills when they see them as *tools* whose appropriate use depends on human purposes. They will learn to see for themselves when to apply them, and when not.

Rather than asking children to perform mechanical skills merely for their own sake, the teacher can first give a reason for using the skill. State the function of the skill, for example, *"We will count the chairs in this room, to see if there are enough."* Next, the teacher can encourage children to consider whether the method being used is the only, or the best way to solve the problem: *"Can anyone think of another way to solve this problem? Which way do you think is best? Why?"* Teachers can also point out any arbitrary aspects of mechanical skills, such as using a particular length as a standard of measurement.

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

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

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

Children could discuss examples from their own experience of persuasion through reason, and other techniques for changing someone's mind such as yelling, whining, forcing, tricking, or wearing someone down through repetition.

Lesson plans in which the strategy is used

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. Seeing the difference between useful simplifications and misleading oversimplifications is important to critical thinking.

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

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 important 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'.

Application: Whenever children or texts oversimplify, the teacher can ask questions which raise the problem of complexity. For instance, if a child or text over-generalizes, the teacher can ask for or provide 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. (*"Was it all M's fault? Did N help create this problem? How? Why?"*) 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 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 children infer character traits from one action or speech (and thus leave children with a collection of un-integrated, fragmented, contradictory snap judgments, rather than a developed, consistent, complete understanding of characters). Children 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 obvious solution work? So, what else must be done? How could these needs and interests be reconciled or addressed?"* The teacher may use analogies with children's' experiences to show the need for more careful explanations of a problem.

A common form of oversimplification in texts occurs when they describe *"the"* reason for or cause of a situation. Children 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, children can learn to avoid simple, pat, self-serving interpretations of events.

When discussing generalizations, the teacher could ask children 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 children 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 children to recognize the possibility that alternative claims may be true, the teacher can help children develop the habit 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 unlike that? How does this model break down? Why? What accounts for the differences? What does that tell us about our subject? Could the model be improved? How? Why is that better?"*

Lesson plans in which the strategy is used

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

Principle: An idea's power is limited by our ability to use it. 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 useful ways to think about new situations. Every time we use an insight or principle, we increase our understanding of both the insight and the situation to which we have applied it. 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", 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, focusing more on basic concepts than on artificial organization of material, encourages children to apply what they have just learned to different but analogous contexts. Using similar information from different situations makes explanations clearer, less vague. Children could compare problems or conflicts from different stories: *"Do you remember the story we read called, '(_____)' What did we say about it? Is it like this story? Can we apply what we discovered to this situation? What does it tell us? What does this situation tell us about the other story?"*

When children 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 children to name, recall, or find analogous situations.

When children 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 children's misunderstandings of what they just learned.

After an idea has been covered, it can be brought up again, whenever useful.

Lesson plans in which the strategy is used

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 ways of thinking and that of all other perspectives are some combination of insight and error. They learn to develop their points 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 peers 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. Children who are unsure what to think can be given time to reflect and come to tentative conclusions. Children 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. Children can compare what they say they believe with how they act.

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

One-to-one Socratic questioning may facilitate development of perspective, especially for children who think they've exhausted their ideas. This strategy will also often coincide with evaluating actions and policies, arguments, or assumptions.

In general, we should look for opportunities to ask children 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.

Explore big questions, helping children 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 help children relate their general ideas to specifics they have studied.

Lesson plans in which the strategy is used

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 children to slow down and reflect before coming to conclusions. When discussing an issue, the teacher can ask children first, *"How would you describe the problem?"* The children should be helped 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 analyzing an issue, teachers can have children discuss such questions as these: *"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 standards should we use? Do we need any facts? 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 true? What would it be like for this claim to be true? False? What evidence would count for it? Against it? Is there a clearer way to say this? Is there a more accurate way to say this? Can it be rephrased? 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 children to distinguish fact from interpretation, the teacher could use questions like the following: *"Is this something that can be directly seen, or would you have to interpret or think about what you saw to arrive at this statement? Is this how anyone would describe the situation, or would someone else see it differently? What other ways of seeing this are there?"* Children might then talk about reasons for the interpretations.

Lesson plans in which the strategy is used

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 to help children analyze concepts. Rather than simply asking them 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 children already understand. The teacher can also supply a range of examples, allowing children to add to the list. The class should discuss the purposes the concept serves. *"Why are you learning this? When would it be useful to use this word? What does it tell us?"*

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

When discussing words or phrases with which children are familiar, we suggest that teachers have children 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 children compare the facts relevant to deciding when the term and its opposite apply. Children 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 say this? 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 not really want 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 'fair rule', though a general discussion of 'being fair' may be helpful, the more specific concept *'fair rule'* should be discussed and contrasted with its opposite.

For concepts that commonly have a lot of irrelevant associations, the teacher can have the children 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 children if they can imagine using the term for situations lacking this or that listed idea. *("If teachers and children gathered in a building to study, but there were no blackboards or desks, is it a school?")* Children 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.

Assemble a variety of pictures — some which clearly illustrate the concept (say, 'tree'), some which illustrate the opposite, or are clearly not examples (such as grass), some which are borderline (large, tree-like bushes), and some you can't tell. Groups of children could sort the pictures into piles. The class can share the groupings, and children could be asked, *"What in the picture makes you put it with*

these? Could you put it in a different pile? Why or why not? Why could you agree about these? Why couldn't your group agree about those?"

Whenever a text or discussion uses one term in more than one sense (such as a technical concept that is also an ordinary word), the teacher can ask the children to state how it is being used in each case or have them paraphrase sentences in which it occurs. Then the teacher can ask children to generate examples in which one, both, or neither meaning of the term applies. For example, children could distinguish ordinary from scientific concepts of work and energy. Children could also look at related words. 'Tired' and 'play' aren't related to the scientific concept 'work'.

When a text confuses two distinct concepts, children can clarify them. Children 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?"* Older children 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 offer an example wherein a group of children has 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 word?"*

Lesson plans in which the strategy is used

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 the children are evaluating something — an object, action, policy, solution, belief — the teacher can ask them what they are evaluating, the purpose of the evaluation, and the criteria they used. With practice, children can begin to 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 and some 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?"*

The teacher can take the children's reasons for beliefs, and make the standards explicit: "Oatmeal isn't good for breakfast 'cause it's yucky." The teacher can point out that the criterion used is taste, and could ask what other criteria are also important when evaluating foods.

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

Lesson plans in which the strategy is used

S-16 Evaluating the Credibility of Sources of Information

Principle: Critical thinkers recognize the importance of using reliable sources of information. 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 more information when 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 the children to check a variety of sources representing *different points of view.* (Texts miss a crucial point here. Having students examine twenty sources representing the same point of view does not teach this principle.)

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: *"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 is saying? What do we know about this person? What experience would you need to have to be an expert? 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? Why?"*

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

Lesson plans in which the strategy is used

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

Principle: Critical thinkers can pursue an issue in depth, covering various 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 perspectives. 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.

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 children are learning.

Application: Texts fail to develop this trait of pursuing root questions by presenting preformulated conclusions, categories, solutions, and ideals, by avoiding crucial or thought-provoking issues or 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 children 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 focused, so that different issues are identified and appropriately addressed. The children, 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.

When a class discusses rules, institutions, activities, or ideals, the teacher can facilitate a discussion of their purposes, importance, or value. Children 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 to it 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 children could raise them and discuss them at length.

Children can go through the assigned material, and possibly other resources, using an important issue(s) 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 focused, rather than fragmented, discussion. Children can begin reading with one or more significant questions and list relevant details as they read.

Lesson plans in which the strategy is used

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 other views. They are especially sensitive to possible strengths of arguments that they disagree with, recognizing the tendency 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 interpretations are 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 children 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 or 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, children 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?"* Children should then be encouraged to argue back and forth, and modify their positions in light of the strengths of others' positions.

Children 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; pinpointing contradictions; distinguishing relevant from irrelevant facts; evaluating evidence; and exploring implications. (See the strategies addressing these skills.)

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

Lesson plans in which the strategy is used

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, or self-serving description ("Susie's mean!" "This isn't going well, how can we do it better?") and then immediately leaping to solutions. They examine the causes of the problem at length. They reflect 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 of it 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 children 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 the students reformulate their descriptions after further examination. They do not suggest analysis of causes. Texts often break problem-solving into steps and have children memorize the steps. They then drill the students on one or two steps. But children 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. When problems arise in the class, the children should be assisted in developing and implementing their own solutions. If the first attempt fails or causes other problems, they should consider why and try again. This way, they can learn the practical difficulties involved in discovering and implementing a workable solution and learn that some problems require perseverance.

When discussing a problem, we recommend that the teacher first have students state the problem, if that has not been done. They 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 causes and solutions proceeds, the children may find it useful to reformulate the description of the problem.

Rather than simply asking children 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? What would happen if we tried this one? Would that help? Are we missing any relevant facts? (Is there anything we need to find out before we can decide which solution is best?) 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? Do any of these solutions ignore someone's needs? How could the various needs be taken into account?"*

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 the class clarify the problem and analyze solutions as described above.

Social studies texts often provide opportunities for use of this strategy when they describe problems people or governments tried to solve. The children can evaluate the text's statement of the problem and its causes, evaluate the solution tried, and propose and evaluate alternatives. Children should be encouraged to explore the beliefs underlying various choices of solutions: *"Why do these people think this solution is best and those people want that one? What does each side claim causes the problem? What does each person assume? What sort of evidence or reasons would support each perspective or way of looking at things? What other ways of looking at the problem could there be? Would one solution be good for everyone? What is your perspective on this problem? (How do you see this problem?) Why?"*

Social studies texts provide innumerable opportunities for exploring crucial problems. *"What problems do we have in our [town, school]? Why? Who is involved in this? How do they cause the problem? 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 we find a solution that would be good for everyone? Why or why not?"*

"What does this passage say was the problem? The cause? Explain the cause. Does it make sense? What other explanations make sense? What else was part of the cause? What was the solution tried? What were the effects? Who was affected? Did the solution work well? Why or why not? What should have been done differently?"

Lesson plans in which the strategy is used

S-20 Analyzing or Evaluating Actions and Policies

Principle: To develop one's perspective, one must analyze actions and policies and evaluate them. Good judgment is best developed through practice: judging behavior, explaining and justifying those judgments, hearing alternative judgments and their justifications, and assessing judgments. When evaluating the behavior of themselves and others, critical thinkers are aware 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 behavior and policy. Critical thinkers base their evaluations of behavior on assumptions which they have reasoned through. They can articulate and rationally apply principles.

Application: The teacher can encourage children to raise ethical questions about actions and policies of themselves and others. They 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 might happen if someone acts this way? How would you feel if someone acted this way toward you? Why? Was this a good way to act? Why or why not?* (Help them make their standards explicit.) *Might someone else use a different standard (see this differently)?"*

Texts often falsely assume that people's stated reasons were their real reasons when the action doesn't fit the reason given. The children can be helped to see this. *"Why did M do that? What reason did M give? What did they do? What result did they say they wanted? What results did it actually have? Who was helped? Hurt? Why? Does that reason make sense as a reason for that action? Was the reason M gave the real reason? Why do you think so?"*

Children 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? Why? What shouldn't they do? Why?"*

These generalizations can be further analyzed and tested by having children compare them to specific cases they have judged in previous lessons: *"Remember what you said last week about X? You said that it was wrong because .... Does it make sense to say that what Y did was right but X was wrong?"*

Lesson plans in which the strategy is used

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. Since they expect intelligibility from what they read, they check and double-check their understanding as they read. They do not mindlessly accept nonsense. 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 what doesn't fit their interpretation. 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.

Application: Children 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 or mean? Assume? Is it clear? Explain it. Does it contradict anything you know or think is 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 or necessary information? Does it favor one perspective or way of looking at things? 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 children describe the plot. Thus, children must pull out the main parts and understand cause and effect while being checked for basic comprehension and recall.

Children 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?"*

They 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 or explain? 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 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?

"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 the children compare and critique them.

Children can discuss their interpretations of what they read. Small groups of children can compare their paraphrases and interpretations, and check back in the book.

When students have misunderstood what they have read, rather than explaining what they missed, the teacher could have them reread more closely.

Lesson plans in which the strategy is used

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 hard to integrate another's thinking into one's 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 speaker. We are not on the inside of his or her point of view. When we listen to others, 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 train of thought.

Consequently, 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 must realize, 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: "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 he 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. We should actively and constructively listen to what our students say, demonstrating 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. Children rarely take seriously their own meanings. They rarely listen to themselves. They rarely realize the need to explain themselves or give examples. We are often in a position to help them do so by asking questions that show that we want to understand them.

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

Children can develop insight into listening skills, as well as improve their skills in distinguishing important from trivial details, noticing cause and effect relationships, and developing the concept 'plot' by discussing movies and TV shows they have recently seen. The children could draw pictures illustrating events and then groups of children can put the pictures in order as part of the discussion.

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

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 our 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. Children often do an assignment poorly because they never clearly understood it in the first place.

The class can also discuss listening, its importance and difficulty, and strategies for listening well. Such discussion should focus on students' own examples of listening well and of misunderstanding, stubbornness, and other problems, why they occurred, and ways of avoiding them in the future. *"What could you have done differently to listen better, check your understanding, help the other person listen better to you?"*

Lesson plans in which the strategy is used

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 (and most real-life issues do), they bring relevant concepts, knowledge, and insights from many subjects to the analysis. They make use of insights from one subject to inform their understanding of other subjects. There are always connections between subjects. To understand, say, reasons for the American Revolution (historical question), insights from technology, geography, economics, and philosophy can be fruitfully applied.

Application: Young children can be encouraged to begin to explore the relationships between their different kinds of books. For example, they could compare pictures of animals in storybooks with pictures of real animals. *"How are these two rabbits alike? Different? Why are they different? Which one seems more like us? Why is this picture in this book? Why is that picture here? Which one shows how real rabbits look?"* Students could listen to stories about, or watch movies about animals and compare the "personalities" of real animals to storybook animals.

Students can evaluate stories they hear or read from the point of view of social studies (or science): *"Is this story realistic? Are the characters realistic, are people*

really like that? Would this character in that situation really act that way? Why or why not? Did the solution to the problem make sense?"

Students should *use* math whenever it would be helpful.

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 children who cannot answer questions about what they read *skim* their texts to find the answer, rather than being supplied with answers. This approach more effectively teaches skill in skimming for specific information than the standard approach to teaching a lesson which drills children.

Teachers could also have children who misunderstood a sentence in their texts find it. Either the sentence was unclearly written, in which case, the children could revise it, or the student didn't read carefully, in which case the class could discuss why the sentence does not mean what the child 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, that is, in thematic units.

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

Lesson plans in which the strategy is used

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, help 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: Children, 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 saying. They can begin to learn how to probe for and question assumptions, judgments, inferences, apparent contradictions, or inconsistencies. They can begin to learn how to question the relevance of what is presented, the evidence for and against what is said, the way concepts or words are

used, the consequences of beliefs. Not only do we need to question children, 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 children comfortable when questioned, so that the questioning process is increasingly valued and mastered. Questioning should be introduced in such a way that the 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 children. 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 their 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 students' responses, use questions like the following: *"Why? If that is so, what follows? How do you know that? Is this what you mean ... 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? How does this relate to what we talked about last week (the story you heard yesterday)? 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? Are you assuming that ...?"* (For more questions, see the section on Socratic discussion in the chapter, "Global Strategies: Beyond Subject Matter Teaching".)

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

To develop children's abilities to use Socratic questioning, the teacher could present an idea or passage to children 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 children can practice questioning each other about issues raised in study, trading the roles of questioner and questioned. The teacher may provide possible initial questions and perhaps some follow-up questions. Children could also be allowed to continue their discussions another day, after they've had time to think. As they 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. *"We began talking about this _____. Some of you said _____, others _____. These arguments were given .... Paige said that X couldn't be right but David disagreed. To find out, we decided we would need to find out _____. So how could we do that?"*

To practice exploring the idea of illuminating and probing Socratic questioning, children could evaluate different kinds of interviews, categorizing the questions asked. They could then think up probing follow-up questions that weren't asked. *"Why would you ask that? How could that be followed up? What would that tell you?"*

Lesson plans in which the strategy is used

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. Whenever we consider concepts or issues deeply, we naturally explore their connections to other ideas and issues within different 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 useful 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 children to explore how what they think about x relates to what they think about y and z. This necessarily requires that their thinking moves back and forth between their own basic ideas and those being presented by the other children, 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, that is, some ideas will clash or be inconsistent with others: *"What would someone who disagreed say? Why? How could the first respond? Why? Etc."*

When a lesson focuses on only one side of an issue or event, the teacher could have children discuss other views. *"What did the other (character, group of people) think? Why?* (Use specific examples from a story or real life situation.) *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?"*

Children could list points from multiple perspectives for reference, then write dialogues of people arguing about the issues. Small groups of children could role-play discussions in front of the class. The class as a whole (or groups of children) could then discuss the role-play: *What was each person's main point? Why did each believe that? What did they disagree about? Why? What did they agree about? Why?"*

Texts occasionally approach teaching dialogical thinking by having children discuss more than one perspective. 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 children move back and forth between points of view. *"What did the fox want? Why? The bunny? Why? The fish? Why? Why did the fox think the bunny was wrong? How did the bunny answer? ... What beliefs do the sides have in common? How would the fish look at this dispute?"*

Lesson plans in which the strategy is used

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. Children 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 micro-skills appropriately.

Application: Dialectical thinking can be practiced whenever two conflicting points of view, arguments, or conclusions are under discussion. Stories provide many opportunities for this. Dialectical exchange between children in science classes helps them begin 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 answer to that reason? What? And the answer to that objection? What evidence does each side use? 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 assumptions is best? What is this side right about? The other side? Is one of these views strongest, does one side make more sense? Why or why not?"*

Lesson plans in which the strategy is used

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 so 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: *"Is this a fact or an ideal? Are things always this way, or is this what people are* trying *to achieve? Are these ideals yours? Why or why not? How have people tried 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?" The children could discuss how to reword misleading portions of their text to make 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: *"Have you ever thought something was true about yourself but acted in a way that didn't fit in with your ideal? Did you see yourself differently then?"*

Sometimes texts foster the confusion between ideals and actual practice 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 could rephrase 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 to cover intellectual dishonesty and inconsistency: *"What were you thinking? Why? Did you know you shouldn't, or did it seem OK at the time? Why?"*

Obviously, the more realistic 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 children to express a range of views on such virtues as generosity.

Lesson plans in which the strategy is used

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 possible 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 thinker, 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', 'criterion', '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 learned by hearing words used in context, teachers should try to make critical terms part of their working vocabulary. When children 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: *"What facts are* relevant *to this issue? What facts must we consider in deciding this issue? What information do we need? How do you* interpret *that statement? What do you think it means?"* The teacher can also rephrase children's statements to incorporate the vocabulary: *"Do you mean that Jane is* assuming *that ...?"*

During discussions, participating children 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 ...?"*

Lesson plans in which the strategy is used

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 don't see *significant* similarities and differences. Things superficially similar are often significantly different. Things superficially different are often essentially the same. Only through practice can we become sensitized to significant similarities and differences. 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 between whales and 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 children 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 children 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 characters, children should use their understanding to illuminate the relationship between them, perhaps to explain factors contributing to conflict. 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 it tell us about our topic? How useful is that comparison? Can anyone think of an even more useful comparison?"

When comparing characters from literature, rather than simply listing differences, children should analyze and *use* their comparisons. *"Why are they different (personality, lives, problems, current situations)?"* Don't let them over-generalize from differences. Texts have children make sweeping statements from one difference in attitude or action. Such differences may not reflect difference in character as much as differences in situation. Relate differences in feelings and behavior to differences in how characters see things. Relate all significant differences between characters to the theme.

Children 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 similar 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? How good is this model? How could it be improved?"*

Lesson plans in which the strategy is used

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. Only by recognizing them can we 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 children 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 their claims. Although it is valuable practice to have children 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.")*

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 assumed this? 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 say about this? What would we need to find out to be able to judge it? How would someone who makes this assumption act?"*

Lesson plans in which the strategy is used

S-31 Distinguishing Relevant From Irrelevant Facts

Principle: To think critically, we must be able to tell the difference between those facts which 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. Whether or not something is relevant is often unclear; relevance must often be argued. Furthermore, 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, children can practice limiting their remarks to facts which are germane to that issue, problem, or conclusion. Often children 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 children 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?"*

When sorting, evaluating, or grouping things or pictures, students can explain their reasons and why their reasons are relevant or important for what purpose. The teacher can use probing questions to have them fully explain themselves: *"Yes, seeing snow in this picture is one thing that tells us it's winter. Is there anything else relevant to figuring out what season it is, anything else that tells us the season? Why is that relevant or important for this?"*

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

Children 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?"*

Another technique for developing children's sensitivity to relevance is to change an issue slightly and have children 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?")

Lesson plans in which the strategy is used

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 children to make inferences based on a wide variety of statements, actions, story titles and pictures, story characters' statements and actions, text statements, and their classmates' statements and actions. They can then argue for their inferences or interpretations. Children 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 children make plausible inferences from them. The class could discuss such passages. Or groups of children might suggest possible inferences which the class as a whole could then discuss and evaluate.

"What can we infer from or tell about this? How did you interpret that, what did you think it meant?"

Teachers can have children give personal examples of when they made bad inferences, and help them begin 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. *"When do we tend to act irrationally? What could we do at those times to make more accurate interpretations, or understand the situation better?"*

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

Children 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?"*

Lesson plans in which the strategy is used

S-33 Giving Reasons and 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 un-stated, unknown reasons can be neither communicated nor critiqued. They are comfortable being asked to give reasons; they don't find requests for reasons intimidating, confusing, or insulting. 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 children to come to conclusions, the teacher can ask for their reasons. *"How do you know? Why do you think so? What evidence do you have?"* When the reasons children 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, children should routinely be asked to show specifically where in the material they got that interpretation. The sentence or passage can then be clarified and discussed, and the student's interpretation better understood and evaluated.

"Why do think so? How do you know? What reasons do you have for thinking that? What facts or evidence do you have for that? Where did we get the evidence? (How do you know that?) Is the source reliable? How could we find out what other evidence exists? What evidence supports opposing views? Is the evidence enough or do we need more? Is there reason to question this evidence? What makes it questionable? Acceptable? Does another view account for this evidence?"

Lesson plans in which the strategy is used

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 focusing 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 children to bring out both viewpoints and practice recognizing contradictions. *"What does X say? What does Y 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? (What happened, causes, values, how a principle applies, etc.)"

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 and did irreparable harm. Children could discuss such examples. The teacher could use questions like the following: *"What did they say? What did they do? Are the two consistent or contradictory? (Does what they said match how they acted, or are they opposite?) Why do you say so? What behavior would have been consistent with their words? What words would have been consistent with their behavior? If they meant what they said, what would they have done? If they said what they meant, what would they have said?"*

When arguing opposing views, children 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 or statement does your disagreement turn? What, exactly, do you disagree with?"*

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

Lesson plans in which the strategy is used

S-35 Exploring Implications and Consequences

Principle: Critical thinkers can take statements, recognize their implications — what follows from them — 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 the children to state the implications of material in their texts, especially when the text materials lack clarity. The process can help children better understand the meaning of a passage. *"What does this imply, or 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?"*

The teacher can suggest, or have children suggest, changes in stories, and then ask them to state the implications of these changes and comment on how they affect the meaning of the story.

Teachers can have children explore the implications and consequences of their own beliefs. During discussions, children 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?"*

Lesson plans in which the strategy is used