



**The Miniature Guide
to**

Practical Ways for Promoting

**Active and Cooperative
Learning**

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*This guide is best used in conjunction with
The Miniature Guide to
Critical Thinking Concepts and Tools*

The Foundation For Critical Thinking

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27 Practical Ways To Improve Instruction

Introduction

Although bringing critical thinking into the classroom ultimately requires serious, long-term development, you don't need to sweat and slave to begin to make important changes in your teaching. Many simple, straightforward, yet powerful strategies can be implemented immediately. Below we offer a sampling of such suggestions. They are powerful and useful, because each is a way to get students actively engaged in thinking about what they are trying to learn. Each represents a shift of responsibility for learning from the teacher to the student. These strategies suggest ways to get your students to do the hard work of learning.

Many enable you to take advantage of what students already know and what they are able to figure out for themselves. Many involve students' working together. All too often students get stuck, or don't understand what they are supposed to do. Several students working together can correct each other's misunderstandings and can make much more progress on tasks. When one student gets stuck, another might have just the right idea to move things along. This enables students to become responsible for more of their own learning. Over time, they begin to adopt the strategies they see their peers use successfully and learn to ask themselves critical questions raised by their peers.

Another advantage of the following suggestions is their wide applicability. Most can be fruitfully applied to any subject, any topic. Most can become standard practice — techniques you continually use. For some of these strategies, we provide examples geared to different content they might be used to teach.

At the heart of our approach is a realistic conception of what it takes for someone to learn something. In a sense, much instruction is unrealistic: "If I say it clearly, they should get it. If they give the right answer, they know it and understand it. If I show them what to do, ask them to do it, and they repeat my performance, they have learned the skill and it is theirs whenever they need it. If

I tell them why something is true or is important and they nod their heads and repeat it back, they understand the truth or importance of what I have said.”

This is not necessarily so. Often students’ failure to do well, to apply what they have covered, to remember in the fall what they learned the previous spring, results from the above naïve misconceptions about what learning requires. Above all, learning requires thinking, critical thinking. To learn, one must continually ask “What does this really mean? How do we know? If it is true, what else would be true?” At the heart of our approach is the conviction that, ultimately, learners must answer these questions for themselves in order to learn, to know, to truly understand. Answers you provide do not entirely sink in unless students’ minds are ready to take them in.

The following suggestions, or “teaching tactics” provide ways to begin this process of enabling students to think their way through the material they are expected to learn, to learn how to use what they learn, and use the power of their own minds to “figure things out”.

1) During Lectures Ask the Class Questions to Arouse Curiosity.

If students want to know a fact — either because their curiosity has been aroused or because it will be of use in their daily living — they will be motivated to learn it. If the questions asked in class are of a probing nature, they will also lead to a deeper understanding.

2) Use Study Questions.

These can be created for every assignment, lecture, and audio-visual presentation. Students are motivated to quiz themselves, and each other, on these questions because exams are based completely on them. The study questions should require some active thinking, not mere memorization. Some of them should test for the ability to understand, explain, illustrate, and apply the concepts and principles being taught. For instance, in a lesson on human anatomy, before the teacher shows slides of the human heart, study questions are handed out to the class. These questions test specific concepts and general principles. Here are

some examples: a) What is a valve? What valves are contained in the heart? What purpose do they serve? b) What is the difference between a vein and an artery? c) What is cholesterol? Why is a high cholesterol level a hazard to one's health? d) Draw a picture of the heart, label each part, and explain how it functions in the total activity of the heart. e) List five functions of the circulatory system and explain how each of these is accomplished. f) Explain how the blood is kept at a constant temperature. g) Define and illustrate by example the principle of "homeostasis". What bodily processes are regulated by this process?

3) Give a Five Minute Quiz at the Start of Each Class.

These can be a few multiple choice or true/false items derived from study questions. Such quizzes motivate students to go over their class room notes and keep up with their homework assignments. On their own, students quiz each other on study questions to prepare for exams. Those who are able to understand the material often explain it to the rest in informal groups after class and before tests.

4) Use Charts.

Public speakers have found that the use of charts and simple statements written on tablets placed in front of the audience serve to focus their attention on the question at hand. This method also facilitates assimilation and retention of material. Charts can also be used to tie everything together into a coherent whole — in which all the relationships between the parts are made explicit.

5) Teach the Principles of Critical Thinking Along with the Subject Matter.

Use the material as concrete examples of critical thinking. For instance when talking about the American Revolution ask the students to compare the point of view of the Colonists with that of the British Government in a fairminded way. The following study questions could be used to get students to think more deeply and critically about their homework assignment: a) What was the

purpose of the revolution? b) What were the Colonists' concept of freedom. How did it differ from the British concept? c) Why wouldn't the British allow the Colonists to secede from the British Empire? d) What assumptions were made by both sides? e) What evidence was cited by the Colonists which led them to conclude that they were being treated unjustly? Was this evidence accurate? Was it biased? Did they leave out any important facts? f) What were the immediate and long term consequences of the Declaration of Independence? Exam questions should be based on these study questions to make sure students will think about them, and hopefully quiz each other on them, outside of class. Throughout the lesson, students will learn the elements of reasoning in addition to American history. They will also learn a little about what it is to think fairmindedly and objectively about our nation's history.

6) Get Students to Know Each Other.

On the first day of class, arrange the students in pairs and have members of each pair ask each other questions about where they came from, their interests, hobbies, and opinions — taking notes to facilitate memory. Then each person introduces his or her partner to the whole class. In that way students get acquainted with each other at the outset. This serves to break the ice and facilitates their communication with each other when they are organized into small groups. It is also an effective exercise in attentive listening.

7) Put Students' Names on Index Cards and Call on All Students, Not Just Volunteers.

Have you noticed that when you ask questions in class, the same students always volunteered to give an answer. If you look around the class and pick less active students and ask them a question, they would feel that you were deliberately trying to show up their ignorance, and consequently resent it. So now try putting all the students' names on index cards, shuffle them and ask students questions in a random order. In that way all of the students will listen to your questions, and all will become active in answering them. This simple technique

avoids the common problem of four or five students doing most of the talking. It also makes a wider range of student thought available to the class (including the teacher). And it keeps the class more alert.

8) Promote Independent Thinking.

Present students with a problem that requires some independent thinking and has several possible solutions. Have the students write their solutions on a piece of paper. Then divide the class up into groups of three or four, and have them share their answers with their group. Afterwards have each group use the best ideas of each person and have them choose one person to communicate their integrated solution to the class as a whole. In this way all students becomes active in: 1) figuring out a solution to the problem, 2) communicating their solution to others, 3) obtaining feedback from others, 4) arriving at a more adequate solution to the problem, and 5) occasionally speaking in front of the whole class, thus giving them practice in public speaking.

9) Promote Careful Listening.

Frequently call on students to summarize in their own words what another student has said. This encourages students to actively listen to each other. It helps them realize that they can learn from each other. This serves to lessen their dependence on the teacher for everything. Hearing another student's comments and questions can be quite instructional. Becoming aware of another student's mistakes or misunderstandings and hearing another student correct them also contributes to a clearer understanding. Students who tune out their peers miss these clarifications. Therefore, you should encourage students to consistently and carefully listen to each other in class. One way of doing this is to frequently ask students to repeat what another student just said. That will keep them alert!

Another tactic we advocate fosters careful listening. Arrange students in pairs. Then ask a controversial question. The students then share their opinions with their partners and justify their positions. Their partners listen carefully

and then repeat back what was said — but in their own words. The first speakers then point out any misunderstandings of the views they had expressed.

10) Speak Less so That Students Think More.

Try not to lecture more than 20% of total class time. Break off your lecture every ten minutes and have students talk to each other in pairs or threes, where they will retell the key points made, and then apply, assess, or explore the implications of the material.

When you are the one doing most of the talking, you are the one doing most of the thinking. As you explain what you know, you may have to express yourself differently, think of new examples, and make new connections. If you can get your students to do more of the talking, they will be thinking through the material and developing a deeper understanding. As one teacher put it “Next year my students will be taking my class; I’ve been taking it for 18 years.”

People’s minds drift in and out of long speeches, and so they miss much of what is said. Breaking up long lectures gives students a chance to be more active — and also assimilate and think about what they’ve heard. Smaller bits are easier to mentally digest than large hunks. And, by pooling their perceptions, students can sometimes correct each others’ misunderstandings before they become deeply ingrained. Having them report on what they discussed helps the teacher correct their misunderstandings.

11) Be a Model.

Think aloud in front of your students. Let them hear you puzzling your way slowly through problems in the subject. Try to think aloud at the level of the students in the class. If your thinking is too advanced or proceeds too quickly, they will not be able to understand and assimilate it.

Just as you often supplement your verbal instructions by demonstrating to students what you want them to do, it’s useful to model for them the kinds of thinking processes you want them to engage in. Modeling careful reading, questioning, or problem-solving conveys much more clearly than verbal instruction

alone, the kind of thing you want them to do. It is therefore crucial that you model work at their level, not at the level of an expert. This includes making mistakes and reasoning your way out of them. This not only shows students that dead ends and mistakes are unavoidable, but helps teach them how to identify when they may be on one.

12) Use Socratic Questioning.

Regularly question your students Socratically: probing various dimensions of their thinking: What do you mean when you use that word? What point are you trying to make? What evidence do you have to support that statement? Is the evidence from a reliable source? How did you arrive at that conclusion? But how do you account for this? Do you see what that would imply? What would be the undesirable side effects of your proposal? How do you think your opponents view that situation? How might they respond to your argument?

13) Promote Collaboration.

Divide the class frequently into small groups (of twos, threes, fours, etc.), give the groups specific tasks and specific time limits. Then call on them to report on what part of their task they completed, what problems occurred, and how they tackled those problems. This provides an excellent way for students to accomplish harder tasks and achieve higher quality in their work than they can when working alone. Students can discover much of their course content for themselves by working on well-chosen tasks in small groups before reading or being given explanations by the teacher. Students who frequently have to explain or argue for their own ideas to their peers, and listen to and assess the ideas of their peers, can make significant process in improving the quality of their thought.

14) Try Pyramid Teaching.

Have students discuss a question or problem in pairs to reach consensus. Then have each pair join with another pair to reach consensus. The groups of four then double-up, and so on.

This is an excellent technique for involving every student and developing their confidence in offering their ideas to their peers. It's not hard for them to talk to one other student; and once they have already expressed and clarified their ideas, it's not as hard to talk in groups of four, eight, or sixteen. Not only does each student have to participate, but each student's ideas become part of the final group effort.

It's a way to maximize both the variety and assessment of ideas. Each time the groups are enlarged, an idea is subjected to more scrutiny. Students then realize that the idea needs to be modified. Thus the idea improves in quality with each step.

15) Have Students Do Pre-writing.

Before lecturing or having students read about a topic, have them write rough notes to themselves on that topic for five minutes. They can then use these as the basis for class discussion or small group discussion. This serves several functions. It gets each student actively engaged in thinking about the topic and it activates each student's previous knowledge and experience. As the students think about the material and write down their ideas, they will be able to contribute more effectively in small group and classroom discussions. Finally, since their minds are already grappling with their own and their peers' ideas, students are better able to comprehend and retain new knowledge.

16) Give Written Assignments that Require Independent Thought.

Require regular writing for class. You needn't grade everything they write. You could randomly sample their work, or else have students pick their best work to revise and submit for grading. Having students critique each other's writing can greatly lessen the time you spend reading and commenting on rough drafts.

Peer editing provides a way to have students get helpful feedback without overburdening the teacher. It also develops students' insight into criteria for good writing and ability to notice errors or need for improvement.

It would be hard to overestimate the benefit to quality of thought to be gained from writing — and especially rewriting. Writing forces people to put their thoughts into words, put the words together into complete thoughts, and organize their thoughts into paragraphs that logically flow together. All of this forces students to think more than they otherwise would and develop their thinking further. It also uncovers thought. Students will think of new ideas as they write. And when they read what they have written, they often find reasons for revising them.

Re-writing and revision are essential to developing disciplined thought and expression. When we are forced to look at our work we learn to ask ourselves crucial questions and assess both thought and expression

17) Have Students Evaluate Each Other's Work.

Give students, or groups of students, the assignment of assessing each other's work. These assignments can take many forms: evaluating and commenting on an individual's work, picking the "best of the group" to be shared with the rest of the class, and suggesting that a student is now ready to turn in an assignment or take a test or quiz. Notes from peer assessments should be turned in.

Peer evaluation has advantages for everyone concerned: it lightens the instructor's load and is useful to both those doing the evaluating and those whose work is evaluated. Students tend to try harder when they know their classmates are going to see their work. They have more internal motivation to put forth their best for "a real audience". They also tend to take comments and suggestions more to heart, rather than attributing criticism to a teacher's arbitrary whim.

But perhaps the greatest advantage is to the students who do the assessing. They gain tremendous insight into standards of good work as they practice

applying those standards to work that is not their own. When they justify or explain their comments and suggestions, they are forced to make those standards explicit.

18) Use Learning Logs.

Have students keep two-column notebooks: 1) have them enter the material they get from reading and writing, and 2) have them enter their own thinking reactions to what they are learning. The latter would include: questions, hypotheses, their own reorganization of the material, their own graphs and charts, as well as comments on their thinking processes and progress. These learning logs can be shared in groups, in which students will compare their ideas. Hypotheses and questions can be made the basis of future assignments and special projects; the notebooks can be periodically turned in for your feedback.

19) Organize Debates.

Sometimes have students present debates on controversial issues. For instance, ask how many in the class think that Physical Education should be a required subject for all students in the school. When they raise their hands, choose two or three students who think that it should be required. Ask them to get together and develop their reasoning. Do the same with those who believe that Physical Education should not be required. The groups spend some time in class developing their strategies. They present their debates the next day. Afterwards, students who had no initial opinion on the topic are asked which side had convinced them and explain why.

20) Have Students Write Constructive Dialogues.

Give students a written assignment in which they will imagine dialogues between people with different perspectives on a current issue such as affirmative action or zero-tolerance policies. Dialogues could also be on the different points of view held by opposing sides in an international dispute. There could

also be a dialogue between a liberal and a conservative. Students are told that each speaker in the dialogue should be intelligent, rational, and fairminded.

When students are composing a dialogue they are required to think from different perspectives. Writing dialogues makes it easier for students to enter the perspective held by someone they disagree with — and to do so fairly. It also forces students to have persons with different perspectives address each other: make objections, raise questions, and propose alternatives. Students must then figure out how each will respond. This forces students to further develop their understanding of each perspective, its strengths and weaknesses. It also helps them see why people would hold a particular position and how they would respond to alternative points of view. Students tend to give much stronger arguments for different perspectives when they write dialogues. In order to write an effective dialogue, they have to empathize with those with a point of view they do not accept. Merely describing the point of view of an adversary does not require such empathy.

21) Have Students Explain Their Current Assignment and its Purpose.

Having students explain the assignment helps clear up misunderstandings before they begin. After they explain the purpose of an assignment in their own words, students will focus more on that purpose. They are more likely to keep their work in keeping with the purpose, rather than running off on tangents.

22) Promote Student Direction.

Have students determine the next step in the study of the current topic. “Given what we now know about this topic, what do you think we should do or focus on next? What information do we need? What do we need to figure out? How can we verify our hypothesis?” Have the class come to a decision about what needs to be done next.

This strategy develops autonomy of thought and intellectual responsibility. It puts some of the burden on students to recognize what they need to address.

Independent thinkers need to develop the habit of taking stock of where they are, what they know, and what they need to know. Putting this decision up to the class gives students some sense of control over what they will be doing. It thus creates greater involvement on the part of students and greater commitment — hence greater motivation.

23) Have Students Document Their Progress.

Tell students to write what they think about a topic before they begin study. Then after the lesson, have them write down their current thinking about the topic and compare it with their initial thoughts. One advantage of this tactic is that it gets students thinking about a topic before exposure to what the teacher and text have to say. Its greatest strength, however, is that it vividly demonstrates to students the progress they have made. It's all there on paper for them to see how their thinking has changed. You can even make this a part of your grading — giving some credit on the basis of how much progress each student has made.

24) Break Projects Down.

Assign a series of small writing assignments, each on a sub-topic of a larger topic. The final assignment, then, can be to re-write the sections as one longer work. Later, have students design similar series of assignments for themselves when they get stuck on projects. Students who are stymied by large tasks often fail to break them down into more approachable tasks. Giving students small, relatively easy assignments enables them to complete each one as a unit — much less daunting than one large paper. By combining the small writings into one larger piece, students not only have to rethink what they have done, but they have been enabled to complete a large, more sophisticated piece of writing. They develop confidence in their ability to do longer projects.

25) Promote Discovery.

Design activities in which students discover insights, principles, and techniques for themselves before presenting material through lecture or reading. For instance, one typing teacher, rather than giving students the complicated formula for centering a table on a page, gave them the task of figuring out how to type a centered table. Having the class brainstorm in response to a problem facilitates such discoveries. These activities are usually best done in small groups, rather than individually. It is also instructive to have students discuss the problems they encountered and how they overcame them.

Whatever students discover for themselves will be more deeply understood. They will not only learn that it is so, but will understand why it is so. Students gain crucial practice in figuring things out and solving problems for themselves, rather than having to be told what to do and how. Furthermore, the more experiences they have of discovering important knowledge for themselves, the more confidence they will have in their own thinking abilities.

When students become involved with an independent project, they sometimes become highly motivated and do more independent thinking. Such projects should be encouraged. Periodic supervision and words of appreciation help sustain motivation.

26) Promote Self-Assessment.

Spell out explicitly the intellectual standards you will be using in your grading. Teach the students how to assess their own work, using those standards. You might first have students formulate what they consider to be the criteria by which their work should be judged. The class can then discuss the appropriateness of each proposed criterion. Another way to teach students self-assessment is to give them copies of old student papers (an A paper, a C, and a D names removed of course), and have them assign a letter grade to each. Then, have students work in small groups to come to consensus on the grades and the

criteria. Whole class discussion can share the results of this and give you the opportunity to raise any points students missed.

The criteria by which you judge student work is more obvious to you than to your students. Being able to enumerate the criteria is not at all the same as actually being able to use them. To recognize when these criteria are met and when they are not, and be able to re-work something to bring it closer to high standards is something that requires considerable practice. Students don't gain these abilities by reciting abstract principles. Teaching students how to assess their own work is one of the most important things you can do to get them to improve the quality of their work.

27) Teach for Usefulness.

Teach concepts, as far as possible, in the context of their use as functional tools for the solution of real problems and the analysis of significant issues. We learn what we value knowing. When students are simply told that what they learn is valuable, but don't actually experience that value and power, they tend to disbelieve, or not truly believe, that there is any point to what they learn.

We should continually demonstrate the value of what we are teaching. No amount of abstract argument will engender the deep, sincere conviction that knowledge is valuable. Such a conviction requires the experience of actually using it. If students begin with an interesting question or problem, and find they can make much more progress on it when they have the insights and skills which a lesson provides, they will gain a greater appreciation of the material in that lesson.

By "taking in" material without applying it to significant issues, students do not learn how to apply what they learn. The best way to solve the problem of transfer is to not create it in the first place. Transfer is impeded when teachers divorce learning from application or postpone fruitful application indefinitely.

Summary

These tactics, and others like them, are useful in generating greater student involvement in the subject matter. They promote active listening and get more individuals to participate in classroom discussions. Students also learn how to summarize the views of others. When students express and justify their own opinions and yet learn to respond empathetically to the ideas of others, they are beginning to use some of the most important abilities required in critical thinking.

Getting students actively thinking about what they are learning in itself is not enough. We don't merely want students to think, but to think well. The tactics we covered do something in this direction. Teachers who use these tactics tend to find distinct, even surprising, improvement in the quality of students' thinking. Still, students best develop critical thinking abilities when they are explicitly taught how to think about their thinking.

In doing this, we need to focus on the analysis and evaluation of reasoning. This involves breaking thinking into its component parts and scrutinizing each part: purpose, question at issue, concepts, assumptions, evidence, conclusions, and implications. Critical thinking activities are essential for analysis and evaluation. In this miniature guide we have not focused on the various component critical thinking skills, traits, and standards.

Finally, we need to introduce critical thinking abilities in a holistic fashion, combining all the separate skills to form a deeper understanding of a subject matter and discover relationships between all its parts. The logic of a discipline needs to be clarified. Insights gained while studying one issue should be transferred to gain an understanding of other issues. Interdisciplinary approaches are used to examine a problem from different perspectives. We focus on these other important goals in other miniature guides. For example, consult *The Miniature Guide to Critical Thinking* and *A Thinker's Guide for Students on How To Study and Learn* (both publications of the Foundation For Critical Thinking).

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The Foundation for Critical Thinking seeks to promote essential change in education and society through the cultivation of fair-minded critical thinking, thinking predisposed toward intellectual empathy, humility, perseverance, integrity, and responsibility. A rich intellectual environment is possible only with critical thinking at the foundation of education. Why? Because only when students learn to think through the content they are learning in a deep and substantive way can they apply what they are learning in their lives. Moreover, in a world of accelerating change, intensifying complexity, and increasing interdependence, critical thinking is now a requirement for economic and social survival. Contact us to learn about our publications, videos, workshops, conferences, and professional development programs.



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