

THE ASPIRING THINKER'S

Guide to Critical Thinking

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The Foundation for Critical Thinking

The background of the cover features a warm, golden-yellow color palette. It depicts silhouettes of several people walking across a city street. In the foreground, there are silhouettes of trees and a street sign. The overall scene is a stylized, high-contrast representation of an urban environment.

Introduction for Teachers and Students

Humans live in a world of thoughts. We accept some thoughts as true. We reject others as false. But the thoughts we perceive as true are sometimes false, unsound, or misleading. And the thoughts we perceive as false and trivial are sometimes true and significant. The mind doesn't naturally grasp the truth. *We don't naturally see things as they are.* We don't automatically sense what is reasonable and what unreasonable. Our thought is often biased by our agendas, interests, and values. *We typically see things as we want to.* We twist reality to fit our preconceived ideas. Distorting reality is common in human life. It is a phenomenon to which we all, at times, unfortunately fall prey.

Each of us views the world through multiple lenses, often shifting them to fit our changing feelings. In addition, much of our perspective is unconscious and uncritical and has been influenced by many forces – including social, political, economic, biological, and psychological influences. Selfishness and narrow-mindedness are deeply influential in the lives of most people.

We need a systematic way to further *sound* thinking and limit *unsound* thinking. We need to take command of our minds in order to determine in a reasonable way what thinking to accept and what to reject. Critical thinking is that process, that orientation, and in the finest cases, that way of living.

This guide focuses on the essence of critical thinking concepts. For teachers it provides a shared concept of critical thinking. For students it introduces critical thinking and provides strategies for developing one's own critical thinking. Teachers can use it to design instruction, assignments, and tests in any subject. Students can use it to improve their learning in any content area.

The skills implicit in this guide apply to all subjects. For example, critical thinkers are clear as to the purpose at hand and the question at issue. They question information, conclusions, and points of view. They strive to be clear, accurate, precise, and relevant. They seek to think beneath the surface, to be logical, and fair. They apply these skills to their reading and writing as well as to their speaking and listening. They apply them in all subjects and throughout life.

If you are a student using this guide, get in the habit of carrying it with you to every class. Consult it frequently in analyzing and synthesizing what you are learning. Aim to deeply learn the ideas you find in it - until using them becomes second nature.

Contents

There are Three Main Kinds of Thinkers	3
The Fairminded Critical Thinker	4
The Selfish Critical Thinker	5
The Naïve Thinker	6
Developing Intellectual Character	7
How to Become a Fairminded Critical Thinker	8
Intellectual Standards Help You Think Better	10
Be Clear: Don't Confuse People	11
Be Accurate: Make Sure it's True	12
Be Relevant: Make Sure You Stay on Track	13
Be Logical: Make Sure Everything Fits Together	14
Be Fair: Make Sure You Consider Others	15
Some Important Intellectual Standards	16
A Checklist of Questions You Can Ask to Target Intellectual Standards	17
Thinking About Fairness	18
Journal Entry Focusing on Unfair Thinking and Behavior	19
We Take Our Thinking Apart to Find Problems in Our Thinking – and Solve Them	20
Think About Purpose	21
State the Question	22
Gather the Information	23
Check Your Inferences	24
Question Your Assumptions	25
Clarify Your Concepts	26
Understand Your Point of View	27
Think Through the Implications	28
Clarifying Inferences and Assumptions	29
Finding Your Inferences and Assumptions	31

Critical Thinkers Seek Better Ways of Doing Things 33**Strategies for Using the Parts of Thinking:**

Analyzing Problems	34
Analyzing Characters in a Story	36
Analyzing Chapters in a Textbook	38
Analyzing Experiments	40
Analyzing the Data Collected (After Experiments)	41
Analyzing Subjects or Disciplines	42
Asking Questions Which Target the Parts of Thinking	43

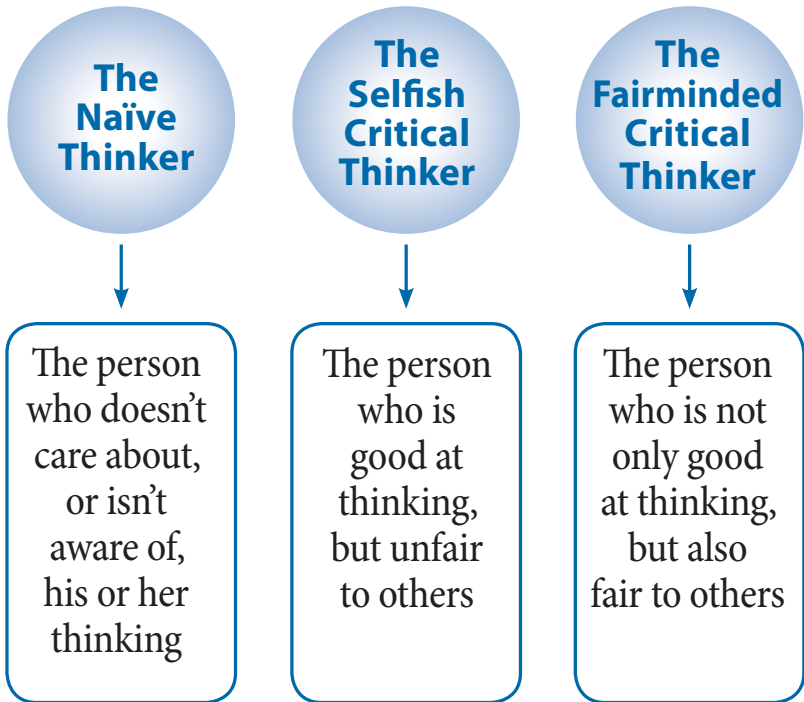
Strategies for Clarifying and Understanding Important Ideas:

Clarifying Your Own Ideas, Clarifying What Others Say	44
Thinking Through Conflicting Ideas	45
Thinking Through Important Ideas	46

Reflecting Upon Important Ideas Learned 47

The Thinker's Guide Library	48
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There are Three Main Kinds of Thinkers



Each of us may sometimes be a naïve thinker, sometimes a selfish critical thinker, and sometimes a fairminded critical thinker.

We can create a better world when we work together to be fair to everyone. We will never be perfect, but we can always improve our thinking.

This guide will help you develop as a fairminded thinker.

The Fairminded Critical Thinker

Fairminded critical thinkers work to improve their thinking whenever they can. They want things for themselves, but they aren't selfish. They want to help other people. They want to help make the world better for everyone. They are willing to give things up to help others (when it makes sense to). They don't always have the right answers, but they work to improve their thinking (and actions) over time.

Here is the voice of the fairminded critical thinker...

"I think a lot. It helps me learn. It helps me figure things out. I want to understand the thinking of other people. In fact, I even want to understand myself and why I do things. Sometimes I do things I don't understand. It's not easy trying to understand everyone and everything. Lots of people say one thing and do another. You can't always believe what people say. You can't believe a lot of what you see on TV and the internet. People often say things they don't mean because they want things and are trying to please you.

"I would like to make the world a better place. I want to make it better for everyone, not just for me and my friends. To understand other people you have to look at things as they do. You have to understand their situation and what you would feel like if you were them. You have to put yourself in their shoes. I think about people who don't have what I have, like people who are starving or homeless. I want to help create a world where everyone has enough to eat and somewhere to live.

"It isn't easy to be fair. It's a lot easier to be selfish and just think about yourself. But the world isn't a nice place to be if people are selfish."



The Selfish Critical Thinker

Selfish critical thinkers are people who use their thinking to get what they want, without considering how their actions might affect other people. They are good at thinking, and they know it. But they are also very selfish. They may be greedy and unkind as well.



Here is the voice of the selfish critical thinker...

“I think a lot! It helps me get what I want. I believe whatever I want to believe as long as it gets me what I want. I question anyone who asks me to do what I don’t want to do. I figure out how to get other people to do what I want them to do. I even figure out how to avoid thinking if I want.”

“Sometimes I say ‘I can’t!’ when I know I could but don’t want to. You can get what you want from people if you know how to manipulate them. Just the other night, I talked my parents into buying me a really expensive new computer gadget I knew they couldn’t really afford. But hey, they work don’t they? They can always make more money. I’m their kid so they should give me what I want.”



“It helps to tell people what they want to hear. Of course, sometimes what they want to hear isn’t true, but that doesn’t matter because you only get into trouble when you tell people what they don’t want to hear. You can always trick people if you know how. Guess what, you can even trick yourself if you know how.”

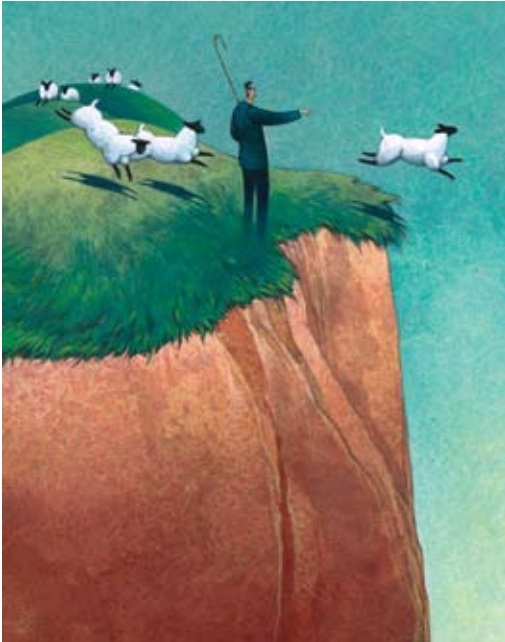
The Naïve Thinker

Naïve thinkers don't see why it is important to work on their thinking. They don't want to be bothered with developing their minds.

Here is the voice of the naïve thinker...

“I don't need to think! I understand everything without thinking. I just do whatever occurs to me to do. I believe most of what I hear. I believe most of what I see on TV and what I read on the internet. I don't see why I should question the messages that come at me on TV shows and the internet. I don't think they affect me that much anyway.

“And I don't need to waste a lot of time trying to figure things out. If I need to find the answer to a problem, I just ask someone else. Other people can figure things out better than me, so why should I try to figure things out for myself? It's a lot easier to say 'I can't!' than to do a

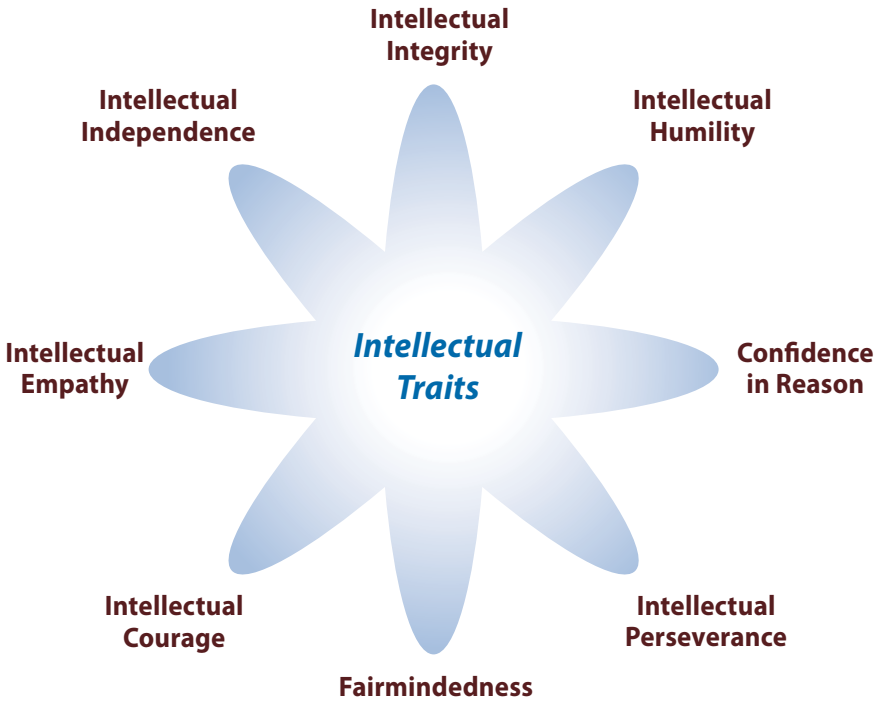


lot of work. A lot of times trying to figure things out takes too much time. And sometimes it's just too hard for me, so why bother?

“I mostly go along with whatever people are doing. It's just easier that way. I do what I'm told, keep my mouth shut, and go along with whatever my friends decide. I don't like to make waves. Thinking gets you into trouble.”

Developing Intellectual Character

Fairminded critical thinkers want to develop intellectual habits or traits. These traits define how they live their lives – how they learn, how they communicate with other people, how they see the world. Here are some of the important intellectual traits or virtues. See if you can figure out what each one might mean before turning the page. When thinking about important ideas, it's always helpful to start with a dictionary.



How to Become a Fairminded Critical Thinker

Intellectual Integrity

Act towards others the way you want people to act towards you. Respect others in the same way you want to be respected. Don't expect others to act better than you are willing to act yourself. Consider the feelings of others in the same way you want your own feelings to be considered. Because you don't want others to be rude to you, avoid being rude to others. Because you don't want to be harmed by others, be careful not to harm others.

Intellectual Independence

Do your own thinking. Figure things out for yourself. It is good to listen to others to find out what they think, but you must do your own thinking to decide who and what to believe. Of course don't just believe what you want to believe. Use intellectual standards to decide; standards like accuracy, relevance, significance and fairness.

Intellectual Perseverance

Don't be a quitter. When you begin to think you can't learn something, remind yourself that *you can*. If reading is hard for you, stick to it (because it is important to learn to read well). When writing is hard, keep trying so you can learn to write better. Don't be afraid to work hard when you feel like giving up. Remember that no matter how good you are at thinking, you can always improve. And no matter how much you struggle with learning, keep trying. *Never give up!* Be the captain of your own ship. Chart your own course in life.

Intellectual Empathy

Always try to understand how other people think and feel. Whenever you disagree with someone, try to see things from that person's point of view. When you do try to see things from other people's viewpoints, you will often find that there are some things you are right about and some things other people are right about. Being able and willing to imagine how others think and feel is very important in life. If everyone did this a lot, the world would be much better for everyone. There would be a lot less pain and suffering.

Intellectual Humility

Recognize that you don't know everything. There is a lot that you don't know (and will never know). Don't say something is true *when you don't know for sure that it is*. Lots of things you *think* are true may not in fact be true. Lots of things people say are true are actually not true and lots of things you read or see on TV are not true. Always ask, "How do I know that? How do you know that?"

Intellectual Courage

Be ready to speak up for what you think is right, even if it is not popular with your friends or the people around you. Of course, sometimes speaking up can be dangerous. Use your best thinking to figure out when it makes sense to speak up and when you should just keep your thoughts to yourself. When you do speak up, try always to show respect for others. But don't ever be afraid to disagree in the privacy of your own mind. And don't be afraid to question your beliefs, to figure out what makes best sense. Develop the courage to look inside your own mind and figure out what is really going on there. Even if you have held a belief for a long time, you still need to be willing to question it, to use the tools of critical thinking to recheck it.

Confidence in Reason

The best chance we have to create a fair and just world is if we use our best thinking, all of us, together, living on the planet. When people disagree, they need to overcome disagreements by looking at the facts, at the evidence. We need to work together to come to the most defensible conclusions. Use intellectual standards in working through problems. For example, make sure you use information that is *accurate* and *relevant* to the problem you are trying to solve. Look for the complexities in deep issues. Avoid superficial answers to complicated problems as they almost never work. Think about problems from different points of view. Trust evidence, facts and reasoning. Distrust blind faith, jealousy and fear.

Fairmindedness

Try to figure out what is most fair in every situation. Think about everyone involved, not just about you. Don't put your desires and needs above those of others. You should even be willing to give things up to help other people when their needs are much greater than yours. Try to imagine what it would be like to think and feel as other people do, to be in their shoes. Don't act until you have done this. Think before you act. Don't act before you think.

Intellectual Standards Help You Think Better

The best thinkers don't believe any and everything they hear or read. They use intellectual standards to decide what to believe. They use intellectual standards to keep their thinking on track. In this guide, we focus on some of the important ones. When you use them every day, your thinking improves.

- Be clear!** — Can you state what you mean?
Can you give examples?
- Be accurate!** — Are you sure it's true?
- Be relevant!** — Is it related to what we are thinking about?
- Be logical!** — Does it all fit together?
- Be fair!** — Am I considering how my behavior might make others feel?
- Be reasonable!** — Have we thought through this problem thoroughly and with an open mind?



If everyone in the world regularly used intellectual standards, we could solve most of our big problems.

Be Clear: Don't Confuse People

We are confused when we are not clear.

We are clear when we understand:

- what we are saying • what we are hearing
- what we are reading • what we are seeing



Ideas can be fuzzy or clear, like letters on an eye chart.

Things you can say and questions you can ask when you want to be clear:

- Let me tell you what I mean. Let me give you an example.
- Could you tell me what you mean?
- Could you say that in other words?
- I'm confused. Could you explain what you mean?
- Let me tell you what I think you said. Tell me if I'm right.

Be Accurate: Make Sure it's True

Something is accurate when it is true or correct, when it is not distorted.

When we aren't sure whether something is true, we check to see if it is.

When we need to be accurate we want to hit our bull's-eye exactly. We don't want our thinking to be distorted in any way.



Questions you can ask to make sure you are accurate:

- How could we find out if this is really true?
- How can we check this?
- How can we test this idea to see if it is true?
- How do I know what I am saying is true?
- How do I know that what I read on the internet is true?
- How do I know that the information in this book is true?
- How do I know that what my friends say is true?
- How can I find out for myself if "X" is true?

Be Relevant: Make Sure You Stay on Track

Something is relevant when it relates directly to:

- the problem you are trying to solve.
- the question you are trying to answer.
- whatever you are talking about or writing about.



All instruments in a cockpit are *relevant* to flying the airplane, but they are not relevant to riding a bicycle.

Questions you can ask when you are not sure whether something is relevant:

- How does what you say relate to the problem?
- How does this information relate to the question we are asking?
- What will help us solve the problem?
- How does what you say relate to what we are talking about?
- How does this relate to our purpose?

Be Logical: Make Sure Everything Fits Together

Thinking is logical when everything fits together, when everything makes sense together.



Questions you can ask when you are not sure whether something is logical:

- This doesn't make sense to me. Can you show me how it all fits together?
- The sentences in this paragraph don't seem to belong together. How can I rewrite this paragraph so that the sentences all fit together?
- What you are saying doesn't sound logical. How did you come to your conclusions? Explain why this makes sense to you.
- The messages I am getting from this TV show don't seem sensible. Should I follow along with these ideas, or should I reject them?

Be Fair: Make Sure You Consider Others

When we consider the feelings of others before we do something we are being fair.

There are many problems in the world because lots of times people aren't fair to others.



It is important to be fair, both to ourselves and to others.

Questions you can ask when you are not sure whether you, or someone else, is being fair:

- Am I being selfish right now?
- Is he or she being selfish right now?
- Am I considering the thinking of others?
- Am I considering the feelings of others?
- Are we being fair to everyone in this situation?

Some Important Intellectual Standards

Remember that good thinkers decide what to believe using intellectual standards. Here are brief definitions of some of the most important ones:

Clarity:

understandable, nothing is confusing about it

Accuracy:

correct, true, not distorted

Precision:

containing the details needed to solve a problem

Relevance:

relating to the matter at hand, directly connected

Depth:

containing complexities that need to be thought through

Breadth:

involving more than one point of view

Logic:

the parts make sense together, no contradictions

Significance:

focusing on the important, not trivial

Fairness:

considering the thoughts and views of relevant others,
not selfish

A Checklist of Questions You Can Ask to Target Intellectual Standards

Clarity

Could you elaborate further?
Could you give me an example?
Could you draw a picture of what you mean?

Accuracy

How could we check on that?
How could we find out if that is true?
Are we sure we aren't distorting the truth?

Precision

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

Relevance

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

Depth

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

Breadth

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

Logic

Does all this make sense together?
Are we looking at this reasonably?
Does what you say follow from the evidence?

Significance

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

Fairness

Am I considering all the relevant viewpoints?
Am I being selfish?
Am I being fair to myself and others?

Think About Fairness

Fair people want to be fair thinkers. But they realize this isn't easy.

Here are some ways that people are unfair:

- | | |
|------------------------|------------------|
| 1) Being cruel | 5) Being unkind |
| 2) Being disrespectful | 6) Being selfish |
| 3) Being inconsiderate | 7) Being mean |
| 4) Being rude | 8) Being hurtful |

Fair thinkers know it isn't always easy to be fair to others. They question their behavior. They ask "How fair, how just, am I being?" Good thinkers see that lots of problems happen when we are unfair to others. And they realize that no one is perfect, that we are all sometimes unfair. They think about their thinking. They even write about their thinking and their behavior. Sometimes they keep a journal. In the journal, they write about problems in their behavior and then try to figure out why they did what they did. For example, they try to figure out what they were thinking that led them to unfair behavior.

On the next page is a journal sheet. You can make copies of it and put your copies in a notebook. Then you can write about your thinking and behavior using these sheets. This will help you see your behavior in the "mirror" of your writing.

Write one journal entry each week using these sheets and see if this helps you become more fair.

Journal Entry Focusing on Unfair Thinking and Behavior

To protect your right to privacy, write only about problems you are willing to share with whoever reads your journal. Focus on problems in which you caused someone else to suffer, problems that resulted from your being cruel or selfish or rude, etc.

I was unfair when I behaved in the following way...

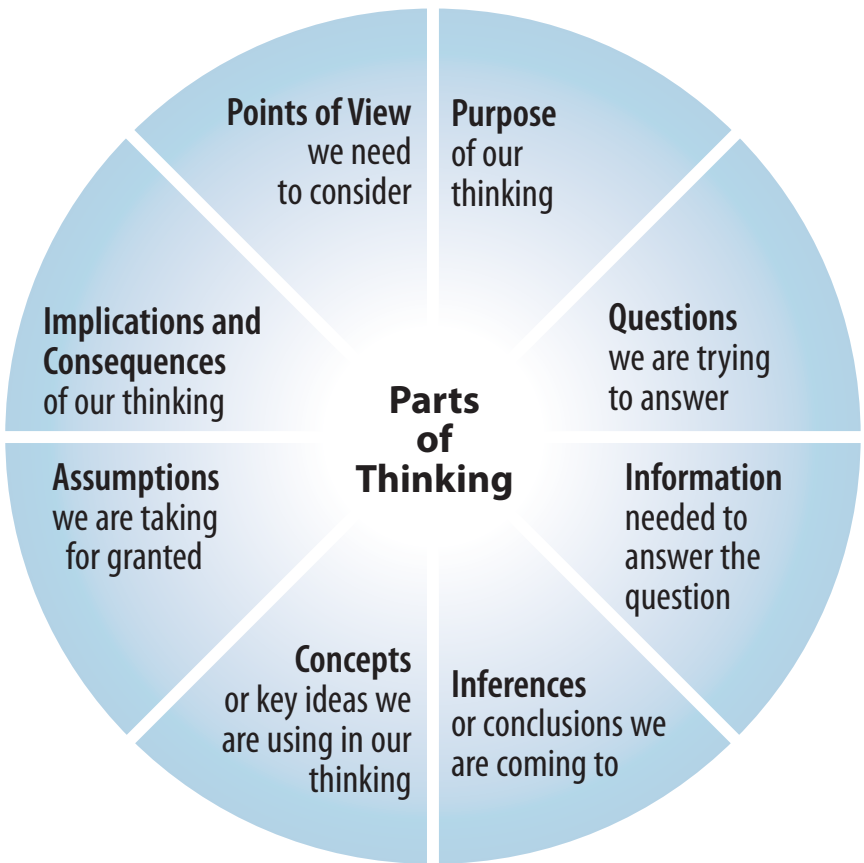
At the time, I didn't realize I was unfair because I thought...

I now realize I was unfair because...

To avoid being unfair in this way in the future I will...

We Take Our Thinking Apart to Find Problems in Our Thinking – and Solve Them

Here are the parts:



Think About Purpose

Your purpose is what you are trying to achieve or make happen.



**Good athletes stay focused on their goals.
Good thinkers do too.**

Questions you can ask to target purpose:

- What is our purpose in doing what we are doing?
- What is my purpose in doing what I am doing?
- What is your purpose?
- What is the purpose of this assignment?
- What is the purpose of the main character in this story?
- What is my teacher trying to accomplish?
- What is my friend's purpose?
- What is the purpose of this textbook?
- Should we change our purpose?
- Is my purpose fair to everyone?

State the Question

The question lays out the problem and helps us understand what we need to do to solve it.

Good thinkers state the question at issue as clearly as possible.

Good thinkers
spend time
figuring out
the questions
they need to ask.



Questions you can ask about the question:

- What question am I trying to answer?
- Is my question clear?
- Should I be asking a different question?
- What question are you asking me?
- What are the main questions in this chapter?

Gather the Information

The information is the facts, evidence, or experiences you use to figure things out.



We are bombarded by information every day — from the internet, TV, radio, friends, relatives, school...
Watch out! Lots of information is not accurate.

Questions you can ask about information:

- What information do I need to answer this question?
- Do I need to gather more information?
- Is this information relevant to my purpose?
- Is this information accurate? How do I know it is?

Check Your Inferences

Inferences are conclusions you come to. It's what the mind does in figuring something out. You make inferences every day. (Jane is my friend, so I infer I can trust her.)

Realize that every time you make an inference, you might make a different, more logical one.



An inference is a step of the mind which happens when the mind says "X is true, therefore Y is true."

For example, "It is raining outside," therefore "I should take an umbrella today" (see pp. 29-31).

Questions you can ask to check your inferences:

- What conclusions am I coming to?
- Are there other conclusions I should consider?
- Is my inference logical?
- Is this other person's inference logical?

Question Your Assumptions

Assumptions are beliefs you take for granted.

(“ I assume we have enough gas in the car for our trip.”)

Usually we don't question them, but we should.



Assumptions are usually unconscious in the mind. We don't know they are there. But we use them to figure things out.

We need to dig them up, examine them, and see if they make sense or not.

Questions you can ask about assumptions:

- What am I taking for granted?
- Am I assuming something I shouldn't?
- What assumption is leading me to this conclusion?
- What is this other person assuming?
- What do teachers often assume about students?
- What do students often assume about learning?

Clarify Your Concepts

Concepts are ideas you use in thinking to understand what is going on and to figure out how to act in a situation.

Good thinkers are aware of the key ideas they are using in their thinking.



What is your concept of "healthy foods?"
What is your concept of "unhealthy foods?"



Questions you can ask to clarify concepts:

- What is the main idea in this story?
- What idea comes into my mind when I hear the word 'school,' 'Christmas,' 'friend,' 'government,' 'peace,' _____?
- What idea am I using in my thinking? Is this idea causing problems for me or for others?
- I think your idea is a good one, but could you explain it a little more?

Understand Your Point of View

(and the point of view of others)

Point of view is what you are looking at and the way it looks to you.

Keep in mind that people have different points of view, especially when they disagree.



You have a point of view.

But can you understand other people's viewpoints?

Questions you can ask about point of view:

- How am I looking at this situation?
- What am I looking at? And how am I seeing it?
- Is there another reasonable way to look at this situation?
- Does my point of view seem to be the only correct one? (Watch out if it does.)
- Do I try to enter and appreciate the point of view of others?

Think Through the Implications



Do you think through possible consequences before you act?

An implication is that to which our thinking is leading us.

When you say things, you imply certain other things. For example, if you make a promise, you imply that you will keep it.

Consequences are the result of something that occurred earlier.

For example, if you are rude to someone, he might be rude back. If he is, it would be a consequence of your being rude first.

Questions you can ask about implications:

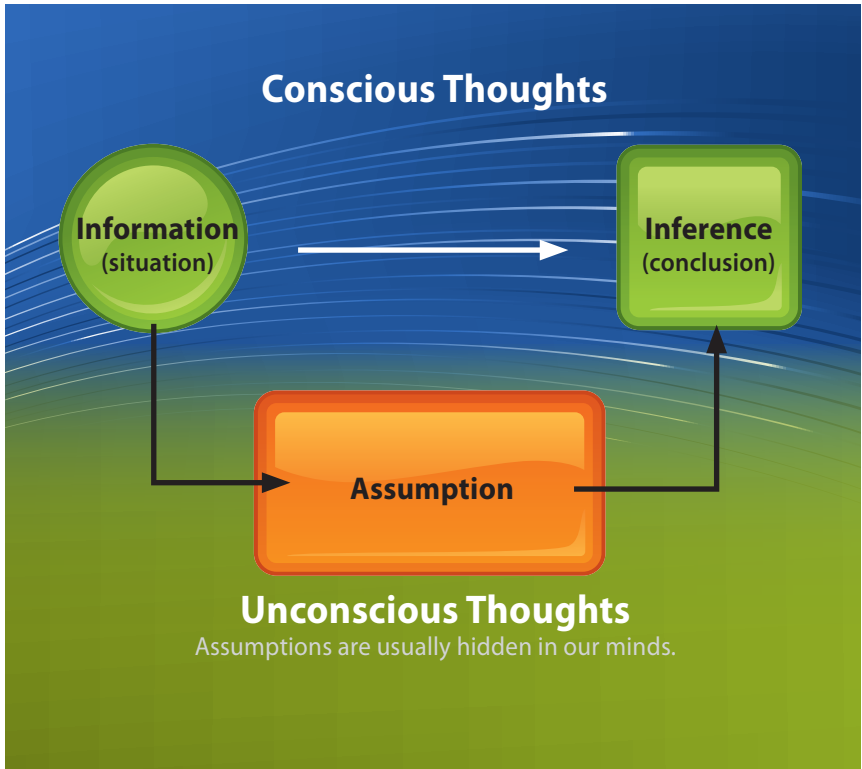
- If I decide to do "X," what things might happen?
- If I decide not to do "X," what things might happen?
- When the main character in the story made an important decision, what happened as a result? What were the consequences?
- What are the implications of trusting people I don't know?
- What are some implications of not acting to stop global warming?
- What are some implications of refusing to do my homework?

Clarifying Inferences and Assumptions

It is important to be able to tell the difference between inferences and assumptions. People often mix up these two different parts of thinking. When you can tell the difference, you start to notice both of them. And as you do, you can check on whether they are justified.

Remember that assumptions are beliefs you take for granted. People don't usually question their assumptions. But they should.

Look at this picture to see how inferences and assumptions work in thinking:



Here are some examples which show how, in every situation, you make inferences. These inferences come largely from your assumptions and the information you have.

Information (situation):	One of my friends walks by without saying hello to me.
Possible inference:	My friend is angry with me.
Assumption that led to the inference:	Whenever my friend walks by without saying hello to me she is angry with me.



Information (situation):	I hear a kitten mewing in the bushes.
Possible inference:	The cat is lost.
Assumption that led to the inference:	Whenever you hear a kitten mewing in the bushes, it is lost.

Finding Your Inferences and Assumptions

You can find your inferences and assumptions using the following strategy. First, figure out the information. Then figure out one inference a person might make when faced with that information. Then go “backwards” to figure out the assumption that led to the inference.

<u>Information</u> (Situation)	<u>Possible inference</u> a person might make	<u>Assumption</u> that leads to the inference
1. The computer freezes while you are in a program.	1. If I restart the computer the program will work.	1. Whenever the computer freezes, restarting it will solve the problem.
2. You see a man sitting on a curb with a paper bag in his hand.	2. The man must be a bum.	2. All men sitting on curbs with paper bags in their hands are bums.
3. One student in class always finishes her tests before everyone else.	3. This student must be smart.	3. Students who finish their tests first are smart.
4. A class assignment doesn't count toward your grade.	4. I don't need to work too hard on this assignment.	4. I only need to work hard on assignments that count toward my grade.

Now think up your own situations. For each one, figure out one inference that someone might make in that situation. The possible inference doesn't have to be logical for this activity. The purpose of this activity is to check whether you understand the difference between assumptions, information, and inferences.

<u>Information</u> (Situation)	<u>Possible inference</u> a person might make	<u>Assumption</u> that leads to the inference
1.	1.	1.
2.	2.	2.
3.	3.	3.
4.	4.	4.

Be aware that inferences follow from assumptions and information. If your assumptions are faulty, or your information inaccurate, your inferences will be faulty as well.

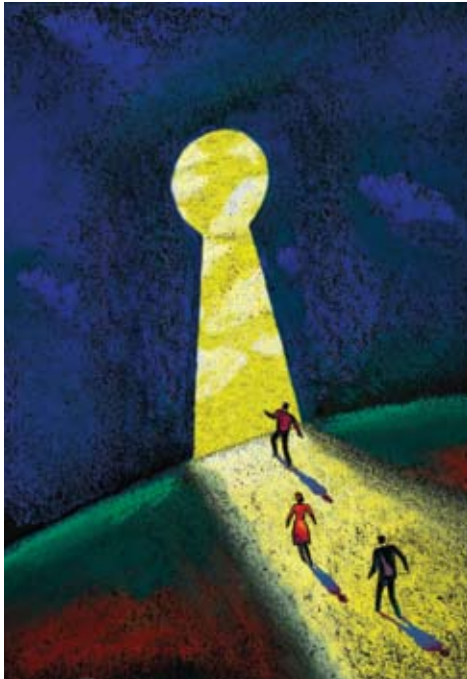
Whenever you come to a conclusion, you make an inference. Everyone makes many inferences every day.

Start to notice them, and see if you can figure out the assumptions that lead to those inferences. Then you will begin to see some problems in your thinking.

The best thinkers are always on the lookout for problems in their thinking. Making your assumptions explicit is one strategy you can use over and over again to find problems in your thinking and deal with them.

Critical Thinkers Seek Better Ways of Doing Things

There's
always a
better way
and I can
find it.



I can
figure out
anything
I need to
figure out.

*Critical Thinkers Believe in
The Power of Their Minds*

Analyzing Problems

Think of an important problem. Then analyze the problem by targeting some of the parts of thinking. Use notebook paper to write out your answers.

The problem is this...

(Write out the problem clearly and precisely, with details. Write the problem in different ways until you get it perfectly clear in your mind.)

This is an important problem because...

The key question that needs to be answered to solve this problem is...

(Every problem has questions connected to it. Here we want you to write out the most important question you need to answer to solve the problem. State it clearly and precisely. Being specific is very important.)

The main purpose in addressing the problem is...

The following information is needed to answer this question...

(Here you are looking for the facts that help you solve the problem.)

Some important assumptions I am using in my thinking are...

(Figure out what you are taking for granted. Make sure these assumptions are reasonable.)

The key ideas (concepts) guiding my thinking as I deal with this problem are... I would describe this idea in the following way...

(For example, if the issue is pollution and how to reduce it, one key idea is “pollution.” Your definition of pollution would be your description of it.)

The points of view relevant to this problem are... I would elaborate these viewpoints in the following way...

(For example, in dealing with the issue of pollution you would have to consider the points of view of: 1) animals affected by pollution, 2) people affected by pollution, 3) people who are causing the pollution and what they might say, 4) people who are working to reduce pollution.)

If this problem gets solved, some important implications are...

(Here you are trying to figure out some important things that should happen if the problem gets solved.)

If this problem does not get solved, some important implications are...

(Here you are trying to figure out some important things that will probably happen if the problem does not get solved.)

After thinking through the parts of thinking above, I think the best solution to the problem is...

Analyzing Characters in a Story

You can use the parts of thinking to understand the thinking of a character in a story. Complete these statements, using notebook paper.

The name of the story is _____.

The character I am focused on is _____.

The most important **problem** the character faces in the story is...

The main **purpose** of the character in the story is...

(If the purpose of the character changes over time, or if the character has more than one purpose, write out all of the important purposes of the character, and state whether the purpose changes during the story, and if so how.)

The most important **information** the character uses in his or her thinking in the story is...

(Look for the facts or experiences the character uses in making important decisions.)

The main **concepts** or ideas the character uses in his or her thinking are... I would elaborate these ideas in the following way...

(Try to figure out the ideas that drive the character to do what she or he does. For example, the main idea might be something like “greed” or “hunger” or “love” or “friendship.”)

The main **assumptions** the character makes (the things he or she takes for granted) are...

(Look for the beliefs the character takes for granted or assumes to be true. These are beliefs that are not questioned by the character.)

The main conclusions (or *inferences*) the character comes to are...

(Look for the most important conclusions the character comes to, the conclusions that lead to important action. Sometimes these conclusions lead the character to make mistakes or cause problems for other people.)

The main consequences (*implications*) of the character's behavior are...

(Characters make decisions and then act on those decisions. Look for the important things that happen after they act. These are the significant consequences.)



Analyzing Chapters in a Textbook

Every textbook, and every chapter in every textbook, has a logic that can be figured out. One important way to do this is by looking at the parts of the author's thinking.

Here is a template to follow:

1) The main purpose of this chapter is...

(Here you are trying to state, as accurately as possible, the author's purpose in writing the chapter. What was the author trying to accomplish?)

2) The key question at the heart of the chapter is ...

(Your goal is to figure out the main question that was in the mind of the author when he/she wrote the chapter. What was the key question she or he addresses?)

3) The most important information in this chapter is ...

(You want to identify the key information the author is using in the chapter to support his/her main arguments. Look for facts, experiences, and/or data the author is using to support his/her conclusions.)

4) The main inferences in this chapter are...

(Figure out the most important conclusions the author comes to and presents in the chapter.)

5) The key **concept(s)** we need to understand in this chapter is (are)...

By these concepts the author means ...

(Look for the most important ideas at the heart of the author's reasoning. These might be concepts like "science" or "power" or "poverty" or "civics.")

6) The main **assumption(s)** underlying the author's thinking is (are)...

(Ask yourself: What is the author taking for granted in this chapter [that might be questioned]? The assumptions are beliefs the author does not think he/she has to defend. Assumptions are usually not stated and therefore can be hard to figure out.)

7a) If people take seriously what this author is saying, some important **implications** are...

(What consequences are likely to follow if people take the author's ideas seriously?)

7b) If we fail to accept what the author is saying, some important **implications** are...

(What consequences are likely to follow if people ignore the author's thinking in this chapter?)

Analyzing Experiments

You can analyze your thinking about a scientific experiment before doing it, by completing these statements:

I would describe the experiment in the following way...

The main **goal** of the experiment is...

The **hypothesis(es)** we seek to test in this experiment is/are...

The key **question** the experiment seeks to answer is...

The controls involved in this experiment are...

The key **concept(s)** or theory(ies) behind the experiment is(are)...

The experiment is based on the following **assumptions**...

The **data** that will be collected in the experiment are...

The potential **implications** of the experiment are...

(Here you are looking for the important

consequences that might follow from information gained during the experiment.)



Analyzing the Data Collected (After Experiments)

After the experiment is finished, look at the data collected and figure out what it means, what it is telling you. Complete these statements:

The **data** collected during the experiment was ...

The **inferences** (or conclusions) that most logically follow from the data are ...

(The inferences are the conclusions you come to after looking at the data.)

These **inferences** are/are not debatable, given the data gathered in this study and the other evidence relevant to this issue.

The hypothesis for this experiment was/was not support by the experiment results. Explain...

The **assumptions** made prior to this experiment should/should not be changed given the data gathered in this experiment. Changes to assumptions (if any) should be as follows...

The most significant **implications** of this experiment are...

Recommendations for future research in this area are...



Analyzing Subjects or Disciplines

When we understand the parts of thinking, we realize that all subjects we study in school have a logic we can figure out. We can use the following questions to do so:

What is the main **purpose** or goal of studying this subject? What are people in this field trying to accomplish?

What kinds of **questions** do they ask? What kinds of problems do they try to solve?

What sorts of **information** or data do they gather?

What types of **inferences** or judgments do they typically make? (Judgments about...)

How do they go about gathering information they use to figure things out in this subject?

What are the most basic ideas, **concepts** or theories in this field?

What do professionals in this field take for granted or **assume**?

How should studying this field affect my **view** of the world?

What **consequences** might follow from study in this discipline? How are the products of this field used in everyday life?

After studying any subject thoughtfully for a whole semester, you should be able to answer these questions about that subject.

Asking Questions in Class Which Target the Parts of Thinking

During class, you can ask questions that focus on the parts of thinking to deepen your understanding of topics or issues being discussed.

For example, on any given day you might ask one or more of the following questions:

- What is our main **purpose** today? What are we trying to accomplish in this class period?
- What **questions** are we asking today?
- What **information** do we need to gather if we want to answer these questions? How can we get this information?
- What is the most basic idea, **concept** or theory we need to understand to answer these questions?
- What **points of view** are relevant to answering these questions?
- What can we safely **assume** as we reason through this problem?
- Should we question any of the **inferences** that have been made by people studying in this field?
- What are some important **consequences** of what we are studying?



Clarifying Your Own Ideas, Clarifying What Others Say

To clarify your thinking, you can do some very basic things:

1. **State** one point at a time.
2. **Elaborate** on what you mean.
3. Give **examples** that connect your thoughts to life experiences.
4. Use **analogies** and **metaphors** to help people connect your ideas to things they already understand. (Consider this analogy: Critical thinking is like an onion. It has many layers. Just when you think you have basically figured it out, you realize there is another layer, and then another, and another and another and on and on.)

SEEI → State, Elaborate, Exemplify, Illustrate

Here is one format you can use to make sure you are clear when speaking or writing your thoughts:

I think... (**state** your main point)

In other words... (**elaborate** on your main point in several sentences)

For example... (give an **example** of your main point)

To give you an analogy... (give an **illustration** of your main point)

There are four questions that can be used to clarify what people are saying to you:

1. Could you state your basic point in one simple sentence?
2. Could you elaborate your basic point more fully (in other words)?
3. Could you give me an example of your point from your experience?
4. Could you give me an analogy or metaphor to help me see what you mean?

Thinking Through Conflicting Ideas

It is important to be able to think about and write clearly on ideas that conflict with one another. After all, lots of ideas do. Here is a structure you can use. Write your answers on your own paper.

- 1. Find two important potentially conflicting ideas. These ideas may be in a textbook or in different books or just two ideas you are concerned with.** For example, you might be concerned with ideas like:
 - individual freedom vs. laws that limit individual freedom
 - human rights vs. protecting the earth
 - love vs. control
 - animal rights vs. human desires
 - mainstream views vs. dissenting views
 - education vs. indoctrination
 - reasonable cooperation vs. blind loyalty
- 2. Think through one important conflict between the ideas you have selected.**
- 3. Clearly state one important point about that idea.** This is your thesis.
- 4. Elaborate your thesis** (in several sentences).
- 5. Give an example of your thesis** (some negative consequences that some people or animals actually experience because of this problem).
- 6. Write out at least one reasonable objection to your position** (from a different point of view).
- 7. Respond to that objection** (pointing out and giving credit to any strengths in this position).
- 8. Construct a dialogue between some one defending your view and someone who (intelligently) opposes it.**

Thinking Through Important Ideas

Every subject has key concepts or main ideas. Use the following guides for figuring out the essence of key concepts. Write your answers on your own paper.

1. State the meaning of the concept in one simple sentence.
2. State the significance of the idea. (This idea is important because...)
3. Give an example of the concept (as it applies to real life).
4. Connect the idea to other important ideas in the subject.
5. Give examples for number 4 above.



Here is a pattern for practicing the guidelines above:

1. X is...In other words...
2. X is important because...
3. For example...
4. This idea is connected to the following ideas within the subject...
5. Some examples that show the relationship between this idea and other important ideas are...

Reflecting Upon Important Ideas Learned

At the end of each lesson, it is a good idea to reflect upon important ideas you have learned and to connect ideas with other ideas you have learned. This will help you build your knowledge and remember important ideas. You can use this reflection sheet in all your classes to deepen your knowledge over time.

Complete these statements:

1. The **purpose** of the activity was... _____

2. The most important conclusions (**inferences**) I have come to in doing this activity are... _____

3. The most important idea (**concept**) I learned in this activity was... _____

4. This idea is important because (**implications**)... _____

5. This idea connects with other important ideas I have already learned including... _____
I would articulate the connections between these ideas as follows... _____
6. Some **questions** I have now that I didn't have before are... _____

7. I can get answers to these questions by doing the following... _____

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The Thinker's Guide series provides convenient, inexpensive, portable references that students and faculty can use to improve the quality of studying, learning, and teaching. Their modest cost enables instructors to require them of all students (in addition to a textbook). Their compactness enables students to keep them at hand whenever they are working in or out of class. Their succinctness serves as a continual reminder of the most basic principles of critical thinking.

For Students & Faculty



Analytic Thinking—This guide focuses on the intellectual skills that enable one to analyze anything one might think about—questions, problems, disciplines, subjects, etc. It provides the common denominator between all forms of analysis. #595m



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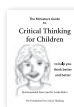
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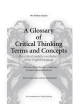
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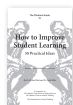


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