

Critical Thinking



McAndersen

McAndersen International Limited



Career Development Series

Critical Thinking

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How to Use This Guide

This Self-Study Guide is designed and laid out in a way that will guide student learning much in the same way that an instructor would. This workbook is comprised of modules called *Sessions*. Each Session focuses on a major concept in the course.

In each *Session*, we have included short-answer and (in some instances) multiple-choice questions which relate directly to the session material. Throughout the guide, you can take the opportunity to internalize what you have learned by completing various self-reflection exercises.

Session One: Course Overview

Course Overview

In today's society, many people experience information overload. We are bombarded with messages to believe various ideas, purchase things, support causes, and lead our lifestyle in a particular way. How do you know what to believe? How do you separate the truth from the myths?

The answer lies in critical thinking skills. The ability to clearly reason through problems and to present arguments in a logical, compelling way has become a key skill for survival in today's world. This course will give you some practical tools and hands-on experience with critical thinking and problem solving.

Learning Objectives

After you complete this course, you will be able to:

- Define critical and non-critical thinking
- Identify your critical thinking style(s), including areas of strength and improvement
- Describe other thinking styles, including left/right brain thinking and whole-brain thinking
- Work through the critical thinking process to build or analyze arguments
- Develop and evaluate explanations
- Improve key critical thinking skills, including active listening and questioning
- Use analytical thought systems and creative thinking techniques
- Prepare and present powerful arguments

Why did you take this course? Use this opportunity to consider your personal learning objectives and reasons for taking this course.

Session Two: Understanding Critical Thinking

Critical thinkers look at things quite differently from non-critical thinkers. When you look at how you approach life, ask questions, or express your curiosity about things, can you identify what method you are using?

In this session, you'll define critical thinking, explore the characteristics of critical thinkers, and consider how to increase your capacity for critical thought.

What is Critical Thinking?

Defining Critical Thinking

According to the 21st Century Lexicon, critical thinking is, “the mental process of actively and skillfully conceptualizing, applying, analyzing, synthesizing, and evaluating information to reach an answer or conclusion.”

In other words, it's about using a specific set of systems and tools to look at a problem, find several alternatives, and choose the best one.

In order to understand critical thinking, let's compare it to non-critical thinking:

Non-Critical Thinking...	Critical Thinking...
○ Sees the world as black and white	○ Accounts for shades of gray
○ Is uninformed and indifferent	○ Is informed and curious
○ Is passive or aggressive	○ Is assertive
○ Is lazy	○ Is active
○ Looks at only the superficial aspects of a problem	○ Looks deeply at a problem and its surrounding issues
○ Is reactive	○ Is proactive
○ Is stubborn and rigid	○ Is flexible
○ Is closed-minded	○ Is open-minded

A Closer Look

Let's look at a simple example. You're working on a project with a team of co-workers. You are at lunch one day when one of them comes up to you in a complete panic and says, "I've heard that the CEO isn't happy about our approach! If we don't change course, we'll all be fired soon!"

A non-critical thinker might accept this statement at face value and react. A critical thinker would look at the different parts of their co-worker's statement and evaluate it objectively, considering both the statement's correctness and relevance.

One of the key ideas behind critical thinking is logic. If your argument is logical, a reasonable person should be able to follow your line of thinking and reach the same conclusion – or at least see how you got there.

Let's take an example. Suppose that I give you these two statements:

- All fruit is good for you.
- Apples are fruit.

What conclusion would you come to? Apples are good for you. Even if you disagree, you should be able to see where I got my conclusion. (A good critical thinker, however, would want to see some proof for those two statements!)

Glossary

When talking about critical thinking, we're going to use some special terms. Let's go over them right now.

Term	Definition
Argument	The framework that a critical thinker uses to convince someone of a particular <i>conclusion</i> with <i>evidence</i> .
Conclusion	The position that a thinker takes on an <i>issue</i> .
Evidence	Facts or reasons that support a particular <i>conclusion</i> .
Issue	The statement or situation under evaluation.

Characteristics of a Critical Thinker

Choose how often each statement applies to you.

	Never	Rarely	Sometimes	Usually	Always
I pay attention to the world around me and try to be observant.					
I am open-minded and listen to other people's point of views.					
I am able to admit when I am wrong.					
I am able to admit that I am not perfect.					
I know that I see the world through a particular set of glasses, and that these glasses may distort my perception.					
I welcome criticism from others.					
I listen actively.					
I speak with impact.					
I have independent opinions.					
I communicate and think assertively.					

Common Critical Thinking Styles

There are some commonly accepted styles of critical thinkers. Unlike other style assessments, you may have one or more predominant styles. To become a better critical thinker, focus on strengthening your weak areas.

The Investigator

- Questions everything
- Very self-aware and honest
- Concerned about facts and figures

The Pilot

- Looks at the big picture and the future
- Good at guiding others through the issues
- Spends majority of time on planning

The Pioneer

- Good at looking at all sides of a problem and identifying the key issues
- Is very curious and adventurous
- Looks for new ideas and approaches to problems

The Learner

- Looks at things very carefully and meticulously
- Spends majority of time on research
- Concerned about doing things correctly and fixing problems

The Soldier

- Good at solving difficult problems
- Perseveres to get to the truth
- Willing to take on challenges

Making Connections

What is your strongest style?

What is your weakest style?

What other styles do you use?

How can you develop your critical thinking skills?

Session Three: Where Do Other Types of Thinking Fit In?

There are different approaches to research about how people think and how our brains work. If you think about you and your best friends, you probably don't all approach things the same way, even if you come up with the same results.

In this session, you'll learn about left and right brain thinking and explore the concept of whole brain thinking.

Left- and Right-Brain Thinking

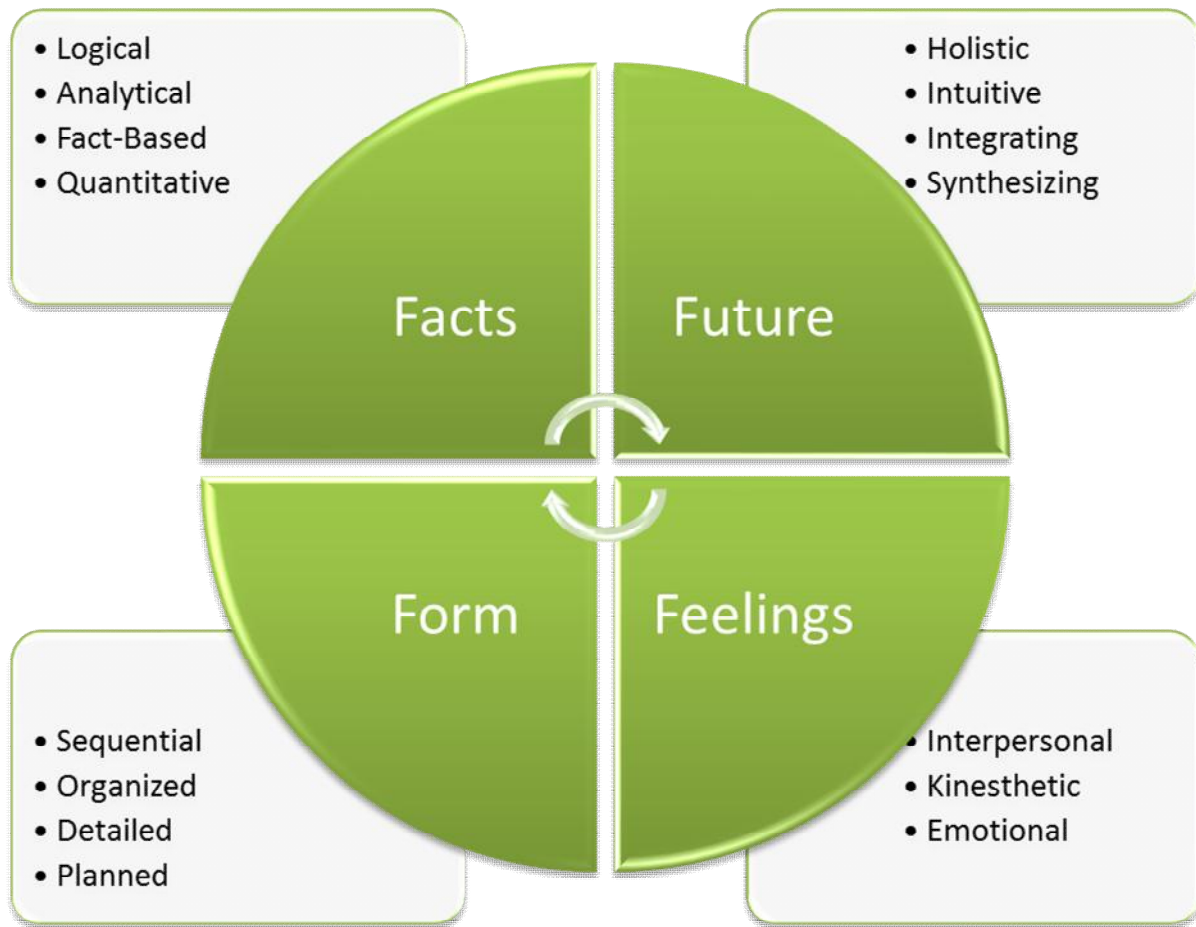
The concept of different characteristics for the left and right brain was explored and explained by scientist Roger Sperry. His theory can be summed up in his own words: "The great pleasure and feeling in my right brain is more than my left brain can find the words to tell you."

Left-Brain Thinkers...	Right-Brain Thinkers...
○ Work with words	○ Work with images
○ Prefer to talk and write	○ Prefer creative methods of expression, such as drawing and music
○ Think logically and sequentially	○ Think intuitively
○ Control feelings	○ Allow feelings to affect their lives
○ Look for differences	○ Look for commonalities and patterns
○ Are planned and structured	○ Are spontaneous and random
○ Are objective	○ Are subjective
○ Look at the parts	○ Look at wholes and think holistically

Think of it this way: with only the left side of your brain, you would be able to read the word "snow" but you wouldn't be able to picture it.

Whole-Brain Thinking

The whole-brain model was developed by Ned Hermann in 1979. It outlines four thinking styles.



(Source: The Whole Brain Business Book, Ned Hermann)

We can use this model as a checklist to ensure we're covering all the bases and thinking critically.

Session Four: Pitfalls to Reasoned Decision Making

There are positives and negatives to practically everything, and there are some pitfalls to reasoned decision making as well. This is to be expected, but knowing what they are can make a big difference!

In this session, you'll learn about identifying and resolving common barriers to critical thinking and decision making.

Pitfalls and Solutions

An important part of critical thinking is learning how to use various reasoning techniques to avoid falling into illogical traps. It can help to understand what those traps can look like so we know when we encounter them.

Building a House on Sand

Definition

Basing your argument on a point that is false.

Example

A co-worker says, "Joe quit last week because of the changes in how we schedule vacation. I guess we need to overhaul the system."

Overcoming It

Use critical thinking techniques to delve into the real problem and issues behind it. In the example above, did Joe really quit because of the policy changes? If so, are others unhappy too? More investigation needs to be done before we decide to act on the problem, because there might not be a problem.

Circular Reasoning

Definition

A claim that is supported only by itself.

Example

Let's say that you're working on a spreadsheet. Value 1 is determined to be Value 1 + Value 2. This cannot be solved because you require Value 1, but you need to know Value 1 to solve the problem.

Overcoming It

Find a better place to begin the argument.

Red Herring

Definition

Introducing volatile information that has no relevance to the argument.

Example

Abdul is making an argument for a new software program. Someone brings up a point that he cannot answer, so he makes an irrelevant point about a recent controversial change to the bonus structure. This causes a firestorm throughout the room and the counter-argument is forgotten.

Overcoming It

Point out the irrelevance of the fact while staying calm.

Emotional Manipulation

Definition

This is when someone attacks you personally, pressures you, uses provocative terms, appeals to your emotions, or ridicules you. They may also use emotional expressions such as laughter or tears.

Example

You are in favor of trying a new organizational system in the office and are sharing your argument. Someone who disagrees with you says, "That's a stupid idea. Everyone will see how dumb you are if you put that in the report."

Overcoming It

Deal with the attack directly by rephrasing it, ignoring it, or asking for clarification directly. (Example: "What do you mean by 'stupid?'")

Negative Arguments

Definition

Using "It's never been done that way before," as a supporting point for an argument.

Example

"I've never seen any other kind of production process, so this must be the only way."

Overcoming It

Point out the limitations of this view to the person. Suggest ways that other solutions could be found.

Omitting Facts

Definition

Leaving out facts that are uncomfortable to deal with or that seem to go against your position.

Example

You are trying to build an argument to support your position that a slowdown in your department was caused by recent weather storms. You purposefully omit the fact that during the month that the storms were at their worst, productivity was up.

Overcoming It

If you are involved in a debate where someone is doing this, point out the missing fact. When building your own arguments, try to be as honest as possible with yourself. Test the argument on someone familiar with the situation to make sure you have included all the facts. Facts that seem to go against your position can actually strengthen it if you can counter them.

Overgeneralizing

Definition

Using popular opinion as an argument.

Example

“Everyone else in the industry uses the Laminator 2000. I guess we should too.”

Overcoming It

Point out the vagueness of the statement and request actual numbers.

Oversimplifying

Definition

This is when a complex problem is attributed to a single event or timing.

Example

Sales slow down around Christmas. The sales manager attributes it to the season and to the loss of a key sales representative.

Overcoming It

Always look for several causes. In this case, the sales manager’s feelings may be true, but they need to be proved.

The Slippery Slope

Definition

This happens when a false assumption is made and other assumptions are built on it.

Example

“If we renovate the office now, we’ll have to re-do all our letterhead and logos!”

Overcoming It

Look at each part of the argument individually. Some points may be valid but you need to separate the wheat from the chaff.

Using the Straw Man

Definition

Choosing one point of another person’s argument, distorting it, and attacking it.

Example

You are arguing for more vacation time for junior employees. Your colleague says, “If we give them more vacation time, they are going to want pay raises, more benefits, and easier tasks too!”

Overcoming It

Bring the focus back to your original statement. Provide more evidence if possible.

Session Five: The Critical Thinking Process

You probably have some things in life that you approach quite systematically. Perhaps you have a method for how you approach your work day, balance your bank account, or plan a holiday. Critical thinking is similar, as you apply a process and work through the steps.

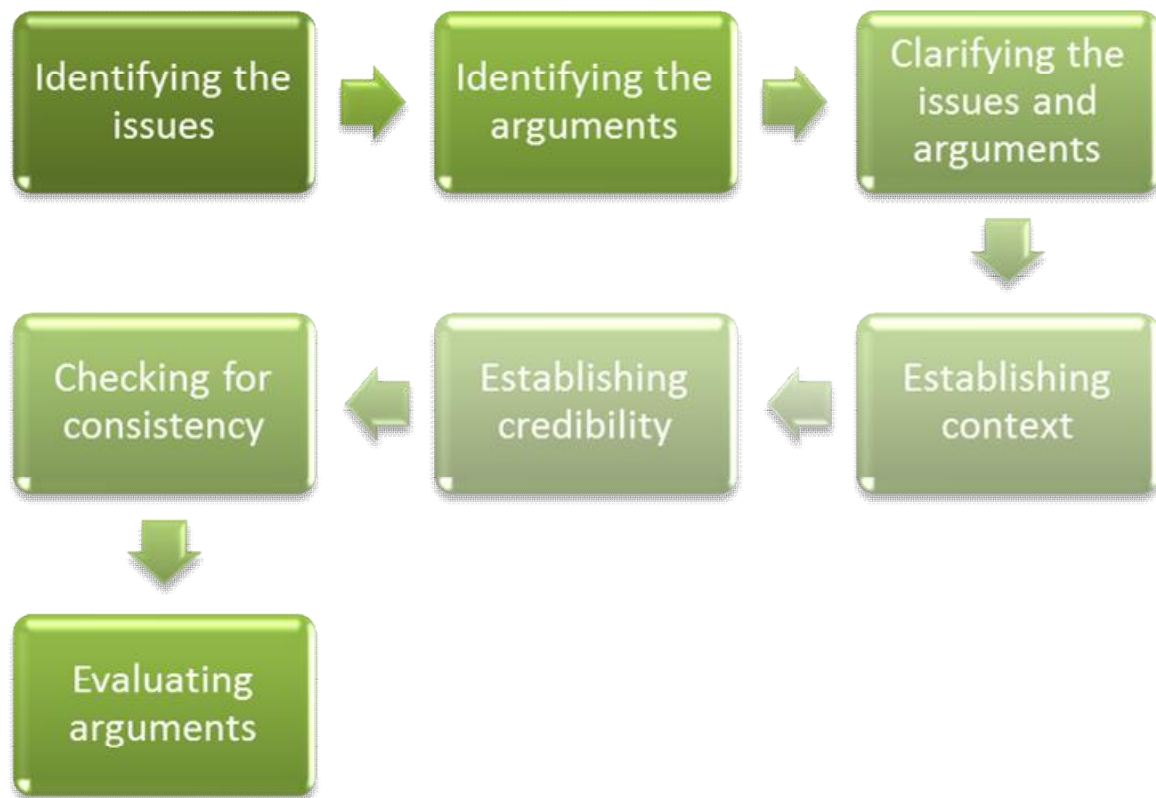
In this session, you'll take an in-depth look at a critical thinking model and apply what you are learning to a case study.

The Critical Thinking Model

A typical problem-solving model has three phases:



A critical thinking model has the same basic structure, but focuses on the first two phases. Here is the overall model. We'll look at individual phases throughout the rest of the course.



The Standards of Critical Thinking

According to the Foundation for Critical Thinking (<http://www.criticalthinking.org>), there are seven standards that critical thinkers should have in their mindset.

Clarity

- Ask for illustrations and examples
- Get hard facts
- Ask the person to elaborate or express the idea in another way

Relevance and Significance

- How does that statement connect to the issue?
- What are the most important parts of the issue, argument, or evidence?

Logic

- Apply common sense
- Connect the dots between the points
- Ask for clarification when points clash with each other

Accuracy

- Look for supporting evidence
- Check and double-check the facts
- Get first-hand information whenever possible

Depth

- Make sure you are not over-simplifying the problem
- Are you covering all the issues?
- Are you covering the most significant issues?

Precision

- Ask for precise measurements (63% rather than “Over half the population”)
- Watch out for vague words

Breadth

- Are you looking at all the points of view?
- How could you gain more perspective?
- Look at it through someone else's eyes (your children, your manager, etc.)

Keep these principles in mind as we work through the critical thinking model.

Identifying the Issues

Getting to the Root of the Problem

American inventor Charles Kettering once said, “A problem well stated is a problem half solved.” You need to know what issue you need to evaluate before you start evaluating it!

The first step in the critical thinking process is to ask yourself, “What is the real issue?” This can be more complicated than it seems, but it is important to get it right. Remember, an issue can be a problem, a situation, a question, or just about anything else!

Here are some tips for identifying the issue.

- Try writing it as a question that can be answered yes or no.
- Be neutral and objective.
- Review the issue statement with others involved to make sure that you have gotten to the core of the problem.
- If there are one or more issues, separate them out so that you can focus on one thing at a time.

Let’s look at an earlier example. A co-worker says, “Joe quit last week because of the changes in how we schedule vacation. I guess we need to overhaul the system.”

You could state the issue as: Should we evaluate our vacation scheduling system?

Case Studies

Identify the issue in each situation.

Situation One

- **Situation:** At a meeting, someone says, “E-commerce is a thing of the past. We need to start focusing on Web 2.0 applications.”
- **Issue:** _____

Situation Two

- **Situation:** There is an e-mail thread circulating with a customer complaint. This customer is unhappy with the new design of your best-selling widget. Someone replies to the thread with, “We need to re-think this product design or we’re all going down the tubes.”
- **Issue:** _____

Situation Three

- **Situation:** One of your employees privately says to you, “Our team’s workspace is really disruptive and disorganized and it’s affecting my productivity. I want it re-arranged right away.”
- **Issue:** _____

Identifying the Arguments

Identifying Arguments

Our next task is to identify the arguments for and against an issue, and to identify the evidence supporting each argument. Ask yourself, “Why would a person take that position?” If a conclusion has already been reached, we will want to identify that as well.

Let’s continue with our earlier example. A co-worker says, “Joe quit last week because of the changes in how we schedule vacation. I guess we need to overhaul the system.”

We stated the issue as: Should we evaluate our vacation scheduling system?

One argument is yes, we should evaluate the current vacation scheduling system. Evidence for this could include facts like the number of complaints about the system from scheduling staff.

On the “no” side, you could have evidence about the phases of change, and point out that no one has had time to get comfortable with the system yet.

Case Studies

Identify a for and against point for each situation.

Situation One

- **Situation:** At a meeting, someone says, “E-commerce is a thing of the past. We need to start focusing on Web 2.0 applications.”
- **Issue:** Should we change our online strategic focus to Web 2.0 applications?
- **For:** _____
- **Against:** _____

Situation Two

- **Situation:** There is an e-mail thread circulating with a customer complaint. This customer is unhappy with the new design of your best-selling widget. Someone replies to the thread with, “We need to re-think this product design or we’re all going down the tubes.”
- **Issue:** Should we evaluate the current widget design?
- **For:** _____
- **Against:** _____

Situation Three

- **Situation:** One of your employees privately says to you, “Our team’s workspace is really disruptive and disorganized and it’s affecting my productivity. I want it re-arranged right away.”
- **Issue:** Is the current workspace configuration affecting team productivity?
- **For:** _____
- **Against:** _____

Clarifying the Issues and Arguments

Now, look at the issue, arguments, and evidence. Check for uncertainty and ambiguity. This can happen if:

- General words like lots, always, usually are used
- Words can have multiple meanings
- Words are in an incorrect order

Clarify the following statements.

Unclear Statement	Revised Statement
Lots of employees don't like that kind of coffee.	
All the big companies use the Acme 2000 printer.	
Our staff is poorly educated.	
There has been a big jump in customer complaints.	
Our carbon footprint has gotten bigger.	
These hamburgers have gotten smaller.	

Establishing Context

Now that we have a good grasp on the argument, evidence, and conclusions, let's look at the environmental factors around them.

First, let's explore the context of the argument. Questions you will want to ask include:

- What is the presenter's purpose?
- Does the presenter have a personal agenda?
- Does the presenter have a relationship with you that they are trying to change?
- Are they trying to get rid of a problem?
- How was the message conveyed?
- Were others meant to hear it?
- Were they trying to distance themselves from the message? (For example, sending an e-mail rather than speaking to you face-to-face.)
- Whose turf was the message delivered on?
- What other factors are present? (Person's status in the company, recent changes at home or work, etc.)

Let's continue with our earlier example. A co-worker says, "Joe quit last week because of the changes in how we schedule vacation. I guess we need to overhaul the system."

What contextual elements could affect this argument?

If you're having trouble identifying the context of a message, try imagining it coming from someone else or through a different medium.

Checking Credibility and Consistency

Credibility

The next thing that you must evaluate is the argument and evidence's credibility. In other words, can you believe this person or not?

Some things that you will want to find out are:

- How did the person find out the information – first hand, second hand, or beyond?
- What kind of background does the person have about the subject?
- How likely is their evidence?
- Is there other evidence, such as documents or witnesses?
- Does your background and observations support their statement?

Continuing with the example of Joe, you'd probably feel differently about your co-worker's statement depending on whether the co-worker had spoken to Joe themselves or overheard someone else talking about it in the lunchroom.

Consistency

Finally, look through the argument for consistency. This is particularly important for formal reports, long e-mails, or complex documents. You want to look for statements that contradict each other or that are true but not relevant.

Case Study: Changing Cafeteria Offerings

Circle the conflicting statements in the following argument.

I believe that we should change our cafeteria's caterer from McSpud to Fresh Go. Although 90% of our workers are generally healthy and in a good weight range, I feel that Fresh Go offers healthier options. I feel that a healthier workforce will increase productivity and morale. Fresh Go has been in operation since 1979 and offers dozens of different types of sandwiches and salads. They have helped over 50 other companies, and could certainly help the 25% of our workforce that is overweight. Fresh Go is also cheaper and meals can be made faster.

Evaluating Arguments

Finally, we have gathered enough information to evaluate the argument and decide on its strength. The five key questions you will need to ask are:

- Is the evidence straightforward and precise?
- How does the context affect the argument?
- Are all pieces of evidence consistent with each other?
- Is the evidence credible?
- Do all the pieces of the evidence support the conclusion?

Case Study

Read the case study and then complete the worksheet.

Background

Congratulations, you have just won 70 million dollars! Now you need to decide what to do with it all. Below you will find a proposal asking for funds. Use your critical thinking skills to evaluate the argument.

Proposal

Dear Lotto Recipient:

I saw that you recently came into a large fortune and would like to propose an endeavor that you might find worthwhile to support. My name is Dr. Annik Bailey. I am a veterinarian and have been with the Foundation for Endangered Animals for almost a year. I have primarily been working in Central Africa, where the bluefin whale is endangered. Many whales are killed each year, primarily due to incurable diseases. A whale disease research center would not only save this precious species, but it would also provide much-needed jobs for the uneducated population in the area.

Thank you for your consideration. I look forward to speaking with you soon.

Yours sincerely,

Annik Bailey

Critical Thinking Worksheet

Issue:

Conclusion:

Evidence:

Analysis:

Is the evidence straightforward and precise?

How does the context affect the argument?

Are all pieces of evidence consistent with each other?

Is the evidence credible?

Do all the pieces of the evidence support the conclusion?

Session Six: A Critical Thinker's Skill Set

Some people ask deep, thought-provoking questions that require the person answering to consider things. Others of us have to work at asking those types of questions and getting to the heart of the matter.

In this session, you'll learn about open and closed questions, using probes, and becoming more critical about the way you approach questions.

Asking Questions

Open Questions

These are broad, general questions that require your conversation partner to provide more than just a “yes” or “no” answer. They also permit the other person to decide how much information to give. Open questions typically start with one of the five W's (who, what, where, when, and why) or ask “How?”

Open questions can do the following:

- Give us more information
- Encourage your conversation partner to speak openly
- Encourage people to share opinions and ideas
- Help us determine if people have interpreted what we say accurately

Closed Questions

Closed questions can be answered with a single word or two, such as a simple yes or no. They can begin the closing process in a conversation, or provide confirmation of a detail, but they don't usually lead to a richer conversation or gathering more information. The advantage of closed questions is that they give you control over the questions and the type of answers you receive. Closed questions are easy to interpret and more questions can be answered in less time.

However, closed questions don't allow for detailed explanations or for the other person to share how they feel about a particular circumstance. If you want to dig deeper and get more information, use open questions.

Probing Techniques

When we do not get enough information by using open-ended questions, we can use probes to expand the conversation.

Verbal and Nonverbal Probes

A probe will encourage your conversation partner to add to their previous response. Verbal probes are often a single word or short phrase. Some examples are:

- “Tell me more about that.”
- “That’s interesting. Tell me more.”
- “Really?”
- “Why?”
- “Can you give me a specific example of what you mean?”

Nonverbal probes rely on your body language and gestures to get the same results as a verbal probe. Some examples are:

- Raising the eyebrows as if you are surprised
- Nodding
- Frowning
- Pursing the lips

Probing Techniques

There are many ways that you can use probing in your conversations. We’ve provided some techniques for you below.

Ask an open question.

Some good questions include:

- “Can you describe that more clearly?”
- “Would you give me a specific example of what you mean?”
- “What do you think we should do?”

You’ll soon recognize that if you ask too many of these questions, your conversation partner will feel like they are under interrogation, so use them carefully.

Pause.

Many of us feel uncomfortable when silence overtakes a conversation, and we will fill the silence by expanding on what was said previously.

Use reflective or mirroring questions.

For example, if someone says “Susan quit because she felt underappreciated,” you may respond by just reflecting back to them, “Underappreciated?” Then pause. Usually, the other person will provide you with an expanded answer without you asking more questions or interrogating. These kinds of statements also serve to focus or clarify and summarize without interrupting the flow of the conversation. They demonstrate your intent to understand the speaker’s thoughts and feelings.

Paraphrase.

Reflect what has just been said in your own words. “So if I understand you correctly, you...” This technique shows that you want to understand your conversation partner and that you want to be accurate. It also allows the sender to hear back what they have said from someone else’s point of view.

Use summary questions.

Summary questions are a helpful way of probing and winding up the conversation at the same time. “In summary, you have found that 90% of employees have not received a pay increase in the past 18 months and that 95% of employees have not received a performance review in the past 24 months. Your research has also shown that 68% of employees would describe themselves as disengaged. Is that correct?”

Summary statements or paraphrases sum up what has been said, and will show that you have listened and absorbed what’s being said. Don’t use them to take over the dialogue.

The summary is the stronger cue that the conversation is winding down on that topic. However, if necessary or appropriate, you can follow this up with a fact-finding question (usually a closed question), such as, “Did you want to say more about the issue?”, or, “Do you have any other suggestions?”

Pushing My Buttons

Choose a statement from the list below.

- I think this city is too hot.
- I really dislike cooking.
- You're not very good at your job.
- I think the report you wrote is terrible.
- Your new hair cut isn't flattering.
- I wish I didn't have to go to that meeting tomorrow.

Write your statement here.

Now, develop a list of probes for that statement.

Critical Thinking Questions

Develop a list of useful critical thinking questions that you used in the probing exercise.

Active Listening Skills

Active listening means that we try to understand things from the speaker's point of view. It includes letting the speaker know that we are listening and that we have understood what was said. This is not the same as **hearing**, which is a physical process, where sound enters the eardrum and messages are passed to the brain. Active listening can be described as an attitude that leads to listening for shared understanding.

When we make a decision to listen for total meaning, we listen for the content of what is being said as well as the attitude behind what is being said. Is the speaker happy, angry, excited, sad...or something else entirely?

Responding to Feelings

The content (the words spoken) is one thing, but the way that people feel really gives full value to the message. Responding to the speaker's feelings adds an extra dimension of listening. Are they disgusted and angry or in love and excited? Perhaps they are ambivalent! These are all feelings that you can reply to in your part of the conversation.

Reading Cues

Really listening means that we are also very conscious of the non-verbal aspects of the conversation.

- What are the speaker's facial expressions, hand gestures, and posture telling us?
- Is their voice loud or shaky?
- Are they stressing certain points?
- Are they mumbling or having difficulty finding the words they want to say?

Demonstration Cues

When you are listening to someone, these techniques will show a speaker that you are paying attention, providing you are genuine in using them.

Physical indicators include making eye contact, nodding your head from time to time, and leaning into the conversation.

You can also give **verbal cues** or use phrases such as "Uh-huh," "Go on," "Really!" and, "Then what?"

You can use **questions** for clarification or **summarizing statements**. Examples:

- “Do you mean they were charging \$4.00 for just a cup of coffee?”
- “So after you got a cab, got to the store, and found the right sales clerk, what happened then?”

Tips for Becoming a Better Listener

- **Make a decision to listen.** Close your mind to clutter and noise and look at the person speaking with you. Give them your undivided attention.
- **Don't interrupt** people. Make it a habit to let them finish what they are saying. Respect that they have thoughts they are processing and speaking about, and wait to ask questions or make comments until they have finished.
- Keep your **eyes** focused on the speaker and your **ears** tuned to their voice. Don't let your eyes wander around the room, just in case your attention does too.
- Carry a **notebook** or start a conversation file on your computer. Write down all the discussions that you have in a day. Capture the subject, who spoke more (were you listening or doing a lot of the talking?), what you learned in the discussion, as well as the who, what, when, where, why, and how aspects of it. Once you have conducted this exercise 8-10 times, you will be able to see what level your listening skills are currently at.
- Ask a few **questions** throughout the conversation. When you ask, people will know that you are listening to them, and that you are interested in what they have to say. Your ability to summarize and paraphrase will also demonstrate that you heard them.
- When you demonstrate good listening skills, they tend to be **infectious**. If you want people to communicate well at work, you have to set a high example.

Session Seven: Creating Explanations

The way we present what we know, and what we think about, has a significant impact on what people think about what we are saying. Having a way to clearly present yourself can help you express your ideas.

In this session, you will learn about explanations, arguments, and the explanation building process.

Defining Explanations

Explanations and Arguments

Another important part of critical thinking is being able to clearly explain why something is a particular way. Instead of trying to persuade someone to a particular point of view, explanations allow you to understand why something happened. Or, you may use the explanation framework to evaluate an argument. Explanations focus on causes, where arguments focus on evidence.

Arguments can be identified by the presence of evidence, such as hard facts or specific events. Explanations can be identified if they appear as an answer to a question. They often appear in the form of opinions, with phrases like “I think,” or, “My guess is...” or, “In my view.” Explanations can, however, be an excellent starting point for arguments.

Mini Case Study

Consider the following **issue**: Attendance has recently been down during quarterly meetings.

- An **argument** could be: A survey of 200 employees shows that attendance is down because the meetings have been moved to Fridays, which is the day that status reports are due.
- An **explanation** could be: I think attendance is down because the meetings have become more boring.

Making Connections

Determine if each statement is an explanation or argument.

Statement	Explanation	Argument
Website traffic has been up 200% since the new feedback system was installed.		
I think the new product hasn't been successful because of the ugly package.		
My guess is that more people visit our store because we're in a better location.		
Recent surveys show that 65% of new parents invest in a college fund.		

Steps to Building an Explanation

There is a four-step cycle that you can use to build an explanation.



Gathering Information

To start, gather as much information as possible from as many different sources as possible. Be open-minded and make sure not to discard anything right away.

What kind of resources might be useful in this stage?

Processing Information

Once information is gathered, it must be processed. This means categorizing the information, assessing its reliability and credibility, and comparing and contrasting similar pieces of information. Your goal is to make sense of what is in front of you.

Developing Hypotheses

Now it's time to synthesize the information that you have gathered and process it into some possible explanations. Typically, three to five tentative hypotheses is a good number to aim for: not too few to restrict yourself, but not too many to overwhelm you.

If you're having trouble developing hypotheses, try asking yourself these questions:

- How might someone else explain this?
- Step back from the data and look at the big picture. What does it tell you?

We'll look at some more ways to generate ideas a little later in this course.

Testing Hypotheses

Finally, it's time to test and evaluate your hypotheses. Ask yourself:

- Does this hypothesis account for all the evidence?
- Does the hypothesis make sense? Is it believable?
- Why is it better than the other alternatives?

Based on the results, you may need to return to a previous phase in the cycle.

Making Connections

Read the case study and then answer the questions.

Background

Congratulations, you have just won 70 million dollars! Now you need to decide what to do with it all. Below you will find a proposal asking for funds. Use your critical thinking skills to evaluate the argument.

Proposal

Dear Lotto Recipient:

I saw that you recently came into a large fortune and would like to propose an endeavor that you might find worthwhile to support. My name is Dr. Annik Bailey. I am a veterinarian and have been with the Foundation for Endangered Animals for almost a year. I have primarily been working in Central Africa, where the bluefin whale is endangered. Many whales are killed each year, primarily due to incurable diseases. A whale disease research center would not only save this precious species, but it would also provide much-needed jobs for the uneducated population in the area.

Thank you for your consideration. I look forward to speaking with you soon.

Yours sincerely,

Annik Bailey

Questions

What kind of information might you want to gather?

Where would you look?

How would you process the information?

What kinds of hypotheses might you develop?

How would you evaluate those hypotheses?

Session Eight: Dealing with Assumptions

We assume a lot. We assume that the planet will continue to revolve around the earth, and that groceries will appear in the local shops. Some assumptions are correct, and others test our ideas of what we expect.

In this session, you'll learn about assumptions and how they can help in your everyday world, as well as how they need to be evaluated.

The Pros and Cons of Assumptions

An assumption is something that you presume to be true. Assumptions help us get through our everyday lives. You wouldn't get very far in your day if you didn't assume that gravity was still present and you kept testing it!

However, when thinking critically, you need to be very careful of assumptions that you and others make. Carefully evaluate assumptions and evaluate whether the person can reasonably make that assumption.

Is it reasonable to anticipate that your ideas (or someone else's) can bear up to the scrutiny of others? That they are actually true?

Session Nine: Common Sense

Have you ever heard the expression, “Common sense is just not that common!” It often gives us a pause for laughter before we start thinking that in some cases, it certainly does appear to be true. What’s your experience with common sense?

In this session, we’ll give some consideration of common sense and its application in terms of critical thinking.

Making Connections

If it takes ten men four days to dig two holes, and five men three days to dig one hole, how many men and how long would it take to dig half a hole?

Consider this argument:

- All cats have purple fur.
- Shadow is a cat.
- Therefore Shadow has purple fur.

Does the logic follow? Is the argument correct?

Session Ten: Critical and Creative Thought Systems

Some people don't think of themselves as creative, and yet all of us are. Having the best tools and methods available can make a big difference in getting the creative juices flowing.

In this session, you'll learn about critical and creative thought systems, including methods to help you think creatively.

Techniques for Thinking Creatively

Brainstorming

Brainstorming is the first thing that comes to most people's minds when we talk about creative thinking. In a brainstorming session, participants need to know that all ideas are encouraged and that their ideas are being asked for. This way, they will be less likely to filter their ideas and more likely to offer creative solutions. There are many ways to run a brainstorming session, and none is better than the other. Use a method that works for your group.

Before Brainstorming

Think about what you want to achieve by conducting a brainstorming session, who to include, and where you will conduct the session. (Sometimes it is best to brainstorm offsite, while other times it is not as important.) Try to establish an informal space and an informal approach so that people can allow their creative juices to flow. If you set this up as a typical meeting, participants may not be as ready to let the ideas flow. Also consider whether you should lead the session or if it might be better to have a guest facilitate.

During Brainstorming

We tend to set up meetings with people sitting around a table and facing each other. Consider instead if you can get people thinking, sharing, and opening up if they sit side-by-side, or with chairs arranged around a flip chart or whiteboard. Clarify some rules of engagement, including the fact that all ideas are welcome and there is no criticism or analysis of ideas during brainstorming; the time to analyze is after the ideas have been raised. Record all ideas to help stimulate more ideas and to see how many ideas can be generated. If you are using a smartboard or someone has a smart phone, you can also take pictures of the completed list for later reference.

After Brainstorming

Once brainstorming itself is finished, have the group look at the options that were presented and start circling the most promising ideas. For each promising idea, have the group take it a little further by making suggestions to make it possible to carry out or to make it practical or attractive as an option. Any constructive criticism should start with statements like:

- “What I like the best about that idea is...”
- “Have you thought about adding...”
- “What if we looked at it from this direction?”

Imagine the Opposite

Write down your idea and then ask people for ways to ensure that it will fail. Write all responses down and then reverse them.

Example: I want to write a newsletter about animals that people will read.

I will ask people: How do I write a newsletter that no one will read?

Possible answers:

- Use small, unreadable type
- Choose topics that aren't relevant to people
- Offer impractical advice
- Don't include experts

Reversed:

- Use large, readable type
- Choose topics that are relevant to people
- Offer practical advice
- Include experts

Breaking Down Assumptions

Try making a list of your assumptions about the current issue. Ask co-workers to add to the list. Then, rephrase each assumption as an open-ended question.

- Example: I assume that we will produce 10 widgets each day.
- Question: How can we make sure we produce 10 widgets each day?

Random Word Method

Another interesting technique is the random word method. First, open a dictionary. Then, close your eyes, choose a page, and point to a word. You must use the first word you choose. Then, write the word on a flip chart and try to figure out how that word applies to your problem.

Perhaps you're working on solutions for a decline in sales and your word is "tiger." You could say that we need a tougher approach, or a brighter idea.

The Triad

Write your issue at the top of a piece of paper. Then divide the rest of the paper into three parts. Label the columns as: What Fascinates Me, A Perfect Situation, and What I'd Do If I Had More Time. Give yourself five minutes to fill out the sheet. Then, look for connections and focus on your favorite ideas.

Secret Characters

Think of someone that you really admire, like Albert Einstein, John Lennon, Bruce Lee, or Madonna. Now, think of your problem or issue through their eyes.

Don't Re-Invent the Wheel

When you've solved a problem successfully, or if you hear about a creative solution, write the solution down in a log. Then, when you're having trouble problem solving, refer back to the log to get your creative juices started. You may even be able to take certain elements of different solutions and bring them together to create a solution for your particular problem.

DeBono's Thinking Hats

Edward DeBono is credited with designing a program for thinking that is well applied to a team process of making decisions, generating ideas, and avoiding things that bog a team down. Called Six Thinking Hats, the idea is to organize the team into separate strands of thinking to keep people focused, and to thoroughly analyze a problem.

Each person is assigned to a particular hat and responsible for putting that type of thinking into the discussion.

- **White Hat:** Facts, figures, and information that is already known or needed.
- **Red Hat:** Emotions and feelings, including hunches and intuition.
- **Black Hat:** Devil's advocate, negative judgment, difficulties, asks why it will not work.
- **Yellow Hat:** Brightness and optimism, positive, constructive, and why something may work.
- **Green Hat:** Creative, possibility, solutions, movement, provocation.
- **Blue Hat:** Process management, benchmarks, staying focused, action plans, and implementation.

At first, people often feel a little awkward about using the different hats, especially if they are assigned a role that they are not completely comfortable with. Awkwardness passes as the benefits to the system becomes apparent. In order to get the team used to the process, apply it in the form of an occasional request to use one hat or to switch from the black hat to a different color.

The great value of the hats is that they provide thinking roles. A thinker can look at things from a different point of view by acting each of these roles. Without the formality of the hats, some thinkers would remain permanently stuck in their most comfortable or usual mode, instead of unleashing some creativity.

Session Eleven: Putting It Into Practice

In order to learn a new skill we have to do much more than read about it. We need to apply the new skills in realistic situations, practice, and get more familiar with them so that we can feel comfortable in applying them.

In this session, you'll get some hands-on practice presenting and communicating your ideas in a range of situations.

Presenting and Communicating Your Ideas to Others

So far, we have learned how to build strong, logical arguments and explanations. However, there is not much point in being able to think and reason critically if you cannot present that information to others.

Here are the steps for preparing a powerful, logical argument.

Define

- Outline your key argument
- Define key terms for your audience

Outline

- List what assumptions you are making
- Categorize evidence
- List points against your argument and gather evidence to counter those points

Organize

- Begin with an introduction summarizing your argument
- Provide various conclusions supported by evidence
- Add examples
- Conclude with a summary

Practice

- Present your argument to people familiar and unfamiliar with the topic
- Edit as necessary

Pre-Assignment Preparation

Prepare a short presentation about the problem outlined in your pre-assignment.

Critical Thinking Worksheet

Issue:
Conclusion:
Evidence:
Analysis: Is the evidence straightforward and precise? How does the context affect the argument? Are all pieces of evidence consistent with each other? Is the evidence credible? Do all the pieces of the evidence support the conclusion?

Presentation Worksheet

Key Issue and Argument:	
Important Terms:	
Assumptions Made:	
Introduction:	
Summarizing Conclusion:	
Conclusion	Evidence
Challenge	Countering Point

Presentations

If possible, deliver your presentation to a friend or co-worker. Have them use the sheet below to evaluate your work.

Key Issue and Argument:		
Conclusion	Evidence	
Evidence Analysis <ul style="list-style-type: none"> ○ Was the evidence clear, precise, accurate, true, and credible? ○ Were all the pieces of evidence consistent with each other? ○ Did the argument flow logically? ○ Do all the pieces of evidence support the conclusion? ○ Was enough evidence presented with enough breadth, depth, and precision? 		
Summarizing Conclusion:		
Did you reach the same conclusion as the speaker? Why or why not?		
Challenge	Countering Point	Did speaker cover challenge?

Recommended Reading List

If you are looking for further information on this topic, we have included a recommended reading list below.

- Browne, Neil M., and Stuart M. Kelley. *Asking the Right Questions: A Guide to Critical Thinking (10th Edition)*. Longman, 2011.
- Cialdini, Robert. *Influence: The Psychology of Persuasion (2nd Edition)*. Collins, 2006.
- DeBono, Edward. *The Six Thinking Hats*. Penguin Books, 2010.
- Elder, Linda, and Richard Paul Elder. *25 Days to Better Thinking and Better Living*. Prentice Hall, 2006.
- . *Critical Thinking: Tools for Taking Charge of Your Professional & Personal Life*. Prentice Hall, 2002.
- Epstein, Richard, and Carolyn Kernberger. *The Pocket Guide to Critical Thinking (4th Edition)*. Advanced Reasoning Forum, 2011.
- Feldman, Daniel. *Critical Thinking: Make Strategic Decisions With Confidence (2nd Edition)*. Crisp Publications, 2010.
- Hamilton, Cheryl, and Cordell Parker. *Communicating for Results (10th Edition)*. Wadsworth Publishing, 2013.
- Hermann, Ned. *The Whole Brain Business Book*. McGraw-Hill, 1996.
- McInerney, D.Q. *Being Logical: A Guide to Good Thinking*. Random House, 2005.

Personal Action Plan

Now that you have completed this course on **Critical Thinking**, how will you use the things you have learned? Creating a personal action plan can help you stay on track and on target. When you take responsibility for yourself and your results, you get things done!

In this session, you will be asked questions to help you plan your short-term and long-term goals. This final exercise is a way for you to synthesize the learning that you have done and to put it into practice.

I am already doing these things well:

I want to improve these areas:

I have these resources to help me:

As a result of what I have learned in this workshop, I am going to...	My target date is...	I will know I have succeeded when...	I will follow up with myself on...