# Critical Thinking

## *A Guide for University Students*

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# Outline

- Critical thinking: What is it, why do you need it?
- Critical thinking: Process and examples
- Critical thinking at job interviews
- Critical thinking resources

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# Without *Critical Thinking*

**… You tend to adopt ideologies rather than information**

**… You tend to believe fake news / misinformation**

**… You just convey memorised pieces of information rather than critically processed and synthesised information (*guess which one is more valuable*!)**

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# What is *Critical Thinking?*

Paul and Elder (2013) recommend asking questions that hold students accountable for meeting their eight standards for critical thinking: clarity, accuracy, precision, relevance, depth, breadth, logic, and fairness, such as:

- How can you validate the accuracy of this statement/evidence?
- How is that information relevant here?
- How well does that conclusion handle the complexities of the problem?
- What is another interpretation or viewpoint on the issue?
- How does this conclusion follow from the data or earlier statements?
- How can both these interpretations be true when they lead to such different conclusions?
- Do you have a vested interest in one position or another? How honestly and impartially are you representing the other viewpoints?

## Unlocking the Mystery of Critical Thinking

By: Linda B. Nilson, PhD

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# What is *Critical Thinking?*

These examples call upon students to think critically:

- What are your reasons for coming to that interpretation/evaluation?
- What are the arguments on this issue pro and con?
- How strong are those arguments? What is the evidence behind them and how solid is it?
- What are the main assumptions behind this line of reasoning?
- How can we interpret these data? What conclusions can we draw, if any?
- What additional information do we need to resolve this issue?
- What are the trade-offs, implications, and consequences of each solution we've discussed?
- By what standards and priorities will you judge the quality of different solutions?
- What are the limitations of your chosen solution?
- How can you defend it against the arguments in favor of other solutions?
- What are some alternatives that we have not yet explored?

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# What is *Critical Thinking?*

## Eight Standards of Critical Thinking

**Clarity**
**Accuracy**
**Precision**
**Relevance**
**Depth**
**Breadth**
**Logic**
**Fairness**

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Unlocking the Mystery of Critical Thinking

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# What is *Critical Thinking?*

**Critical thinking is not only one of the most demanded skills in the job market; it assists us to avoid deceitful influences of fake news, frauds, demagoguery, propaganda, and so on.**

**There is always a high chance that we can be the victims of disinformation if not aware. There is a noteworthy list of objective and evidence-oriented websites that detect fake news and political rumors.**

Book Review

Adult Education Quarterly
1–2


Nilson, L. B., (2021). *Infusing critical thinking into your course: A concrete practical approach*. Stylus. 148 pp. $29.00 (paperback)

**Reviewed by:** Thiri Soe, *Graduate School of International Cultural Studies, Tohoku University, Japan*

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# What is *Critical Thinking?*

## Historical Examples of Critical Thinking

It can be easier to find examples of excellence in critical thinking in hindsight. Often, such instrumental individuals had to buck prevailing trends, incurred discouragement from those in authority, and had to persevere for their ideas or concepts to be accepted. Some may have achieved success in their lifetime, while it may have taken more time for other ideas to go mainstream. **Being able to think critically and apply reason to complex issues of the day provided the avenue for powerful contributions to the world.**

### 1. Socrates

**Socrates** developed a method of critical thinking whereby individuals could ask probing questions. This often revealed that a lack of supportive evidence or contradictory beliefs laid behind the rhetoric. **It showed that anyone, even those in authority and believed to have sound judgment, may think in an irrational manner.** Ideas should be deeply considered before being believed by an audience, as those in leadership roles may still have their own misconceptions.

### 2. Machiavelli

**Machiavelli** did not believe that the government functioned as authorities stated. Rather, he assessed the politics of the time and exposed the political agendas of those in power, including **inconsistencies and contradictions that occurred in the political arena of the Italian Renaissance.** Much of his analysis and findings are shared in *The Prince*.

### 3. Albert Einstein

Running contrary to established scientific principles of his lifetime, **Albert Einstein** used critical thinking to debunk such principles and create new ones. **Mathematical explanations of special relativity, general relativity and the photoelectric effect are only a few of Einstein's contributions.** Winner of the Nobel Prize in 1921, many of his theories are still relevant today, and few people remain unaware of this influential scientist of the 20th century.

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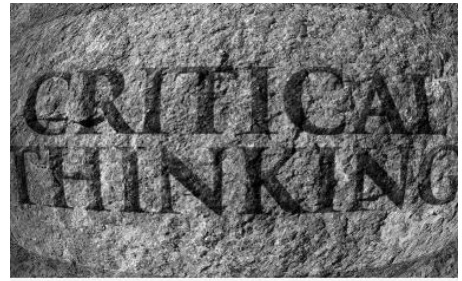
# What is *Critical Thinking?*

## Bertrand Russell's 10 Commandments of Critical Thinking

1. Do not feel absolutely certain of anything.
2. Do not think it worthwhile to proceed by concealing evidence, for the evidence is sure to come to light.
3. Never try to discourage thinking, for you are sure to succeed.
4. When you meet with opposition, even if it should be from your husband or your children, endeavor to overcome it by argument and not by authority, for a victory dependent upon authority is unreal and illusory.
5. Have no respect for the authority of others, for there are always contrary authorities to be found.
6. Do not use power to suppress opinions you think pernicious, for if you do the opinions will suppress you.
7. Do not fear to be eccentric in opinion, for every opinion now accepted was once eccentric.
8. Find more pleasure in intelligent dissent than in passive agreement, for if you value intelligence as you should, the former implies a deeper agreement than the latter.
9. Be scrupulously truthful even if the truth is inconvenient, for it is more inconvenient when you try to conceal it.
10. Do not feel envious of the happiness of those who live in a fool's paradise, for only a fool will think that it is happiness.

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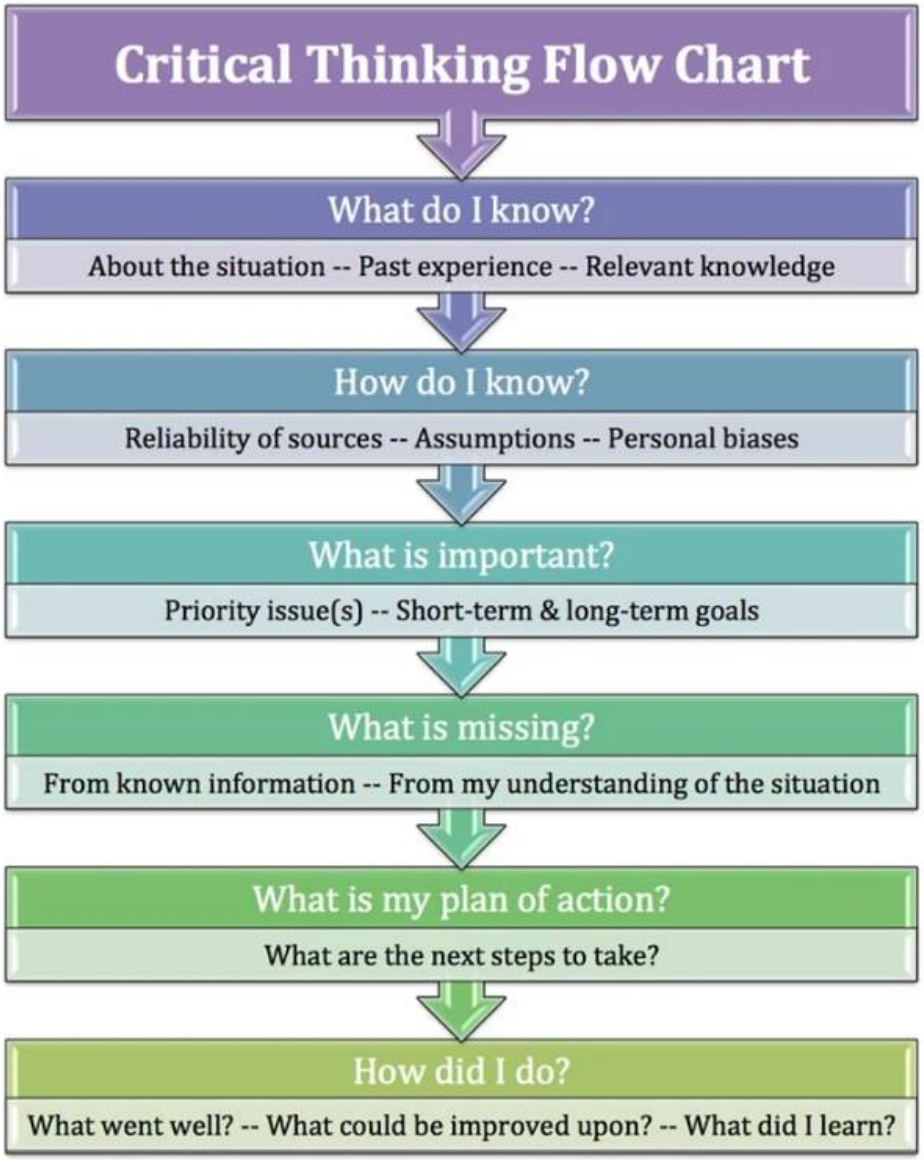


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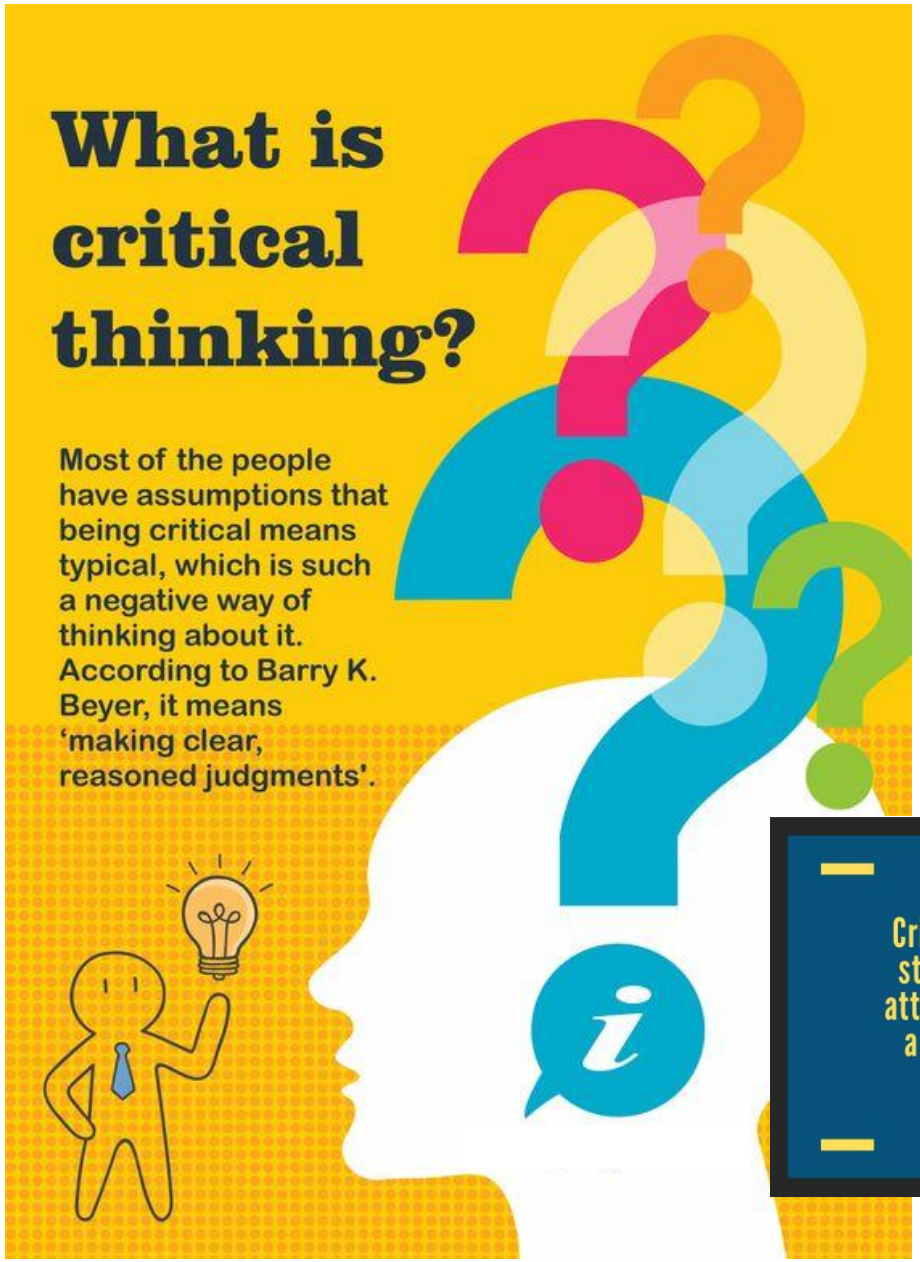


> Critical thinking in its most refined state is a frame of mind and set of attitudes and dispositions as well as a number of cognitive operations.
>
> Barry K. Beyer, *Practical Strategies for the Teaching of Thinking*

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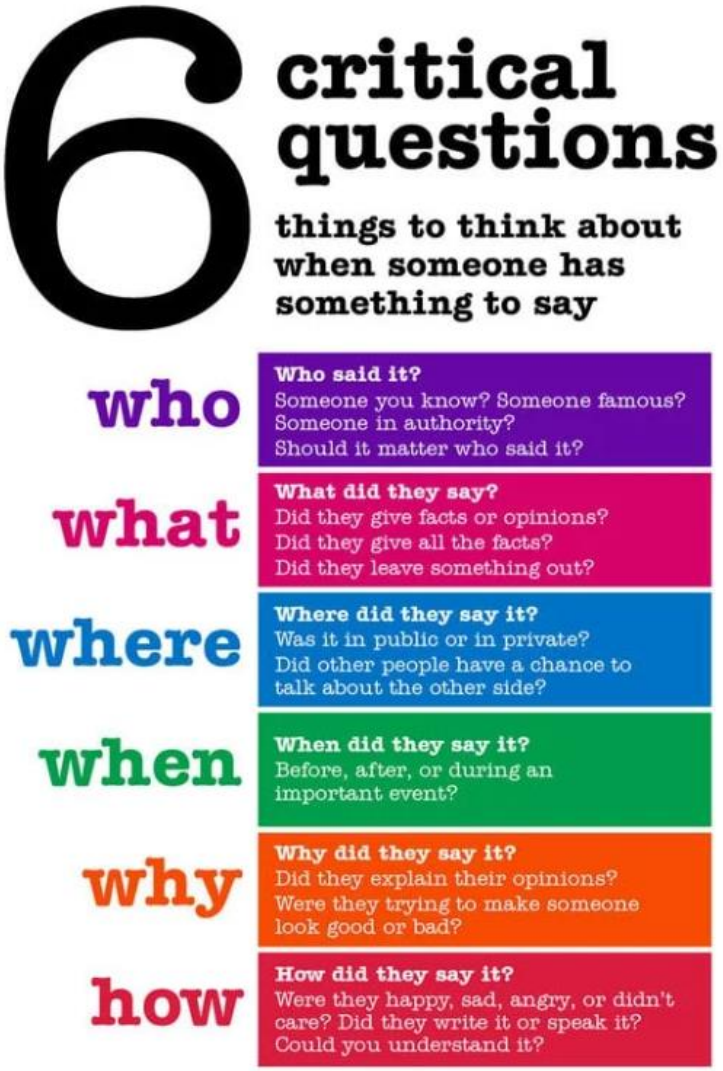


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# Critical Thinking


## What is Critical Thinking?

Critical thinking is the ability to think clearly and rationally, understanding the logical connection between ideas. Critical thinking has been the subject of much debate and thought since the time of early Greek philosophers such as Plato and Socrates and has continued to be a subject of discussion into the modern age, for example the ability to recognise fake news.

Critical thinking might be described as the ability to engage in reflective and independent thinking.

**In essence, critical thinking requires you to use your ability to reason. It is about being an active learner rather than a passive recipient of information.**

**Critical thinkers rigorously question ideas and assumptions rather than accepting them at face value. They will always seek to determine whether the ideas, arguments and findings represent the entire picture and are open to finding that they do not.**

**Critical thinkers will identify, analyse and solve problems systematically rather than by intuition or instinct.**

### Someone with critical thinking skills can:

- ✔ **Understand the links between ideas.**
- ✔ **Determine the importance and relevance of arguments and ideas.**
- ✔ **Recognise, build and appraise arguments.**
- ✔ **Identify inconsistencies and errors in reasoning.**
- ✔ **Approach problems in a consistent and systematic way.**
- ✔ **Reflect on the justification of their own assumptions, beliefs and values.**

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# Critical Thinking


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**Think of something that someone has recently told you. Then ask yourself the following questions:**

**Who said it?**

*Someone you know? Someone in a position of authority or power? Does it matter who told you this?*

**What did they say?**

*Did they give facts or opinions? Did they provide all the facts? Did they leave anything out?*

**Where did they say it?**

*Was it in public or in private? Did other people have a chance to respond an provide an alternative account?*

**When did they say it?**

*Was it before, during or after an important event? Is timing important?*

**Why did they say it?**

*Did they explain the reasoning behind their opinion? Were they trying to make someone look good or bad?*

**How did they say it?**

*Were they happy or sad, angry or indifferent? Did they write it or say it? Could you understand what was said?*

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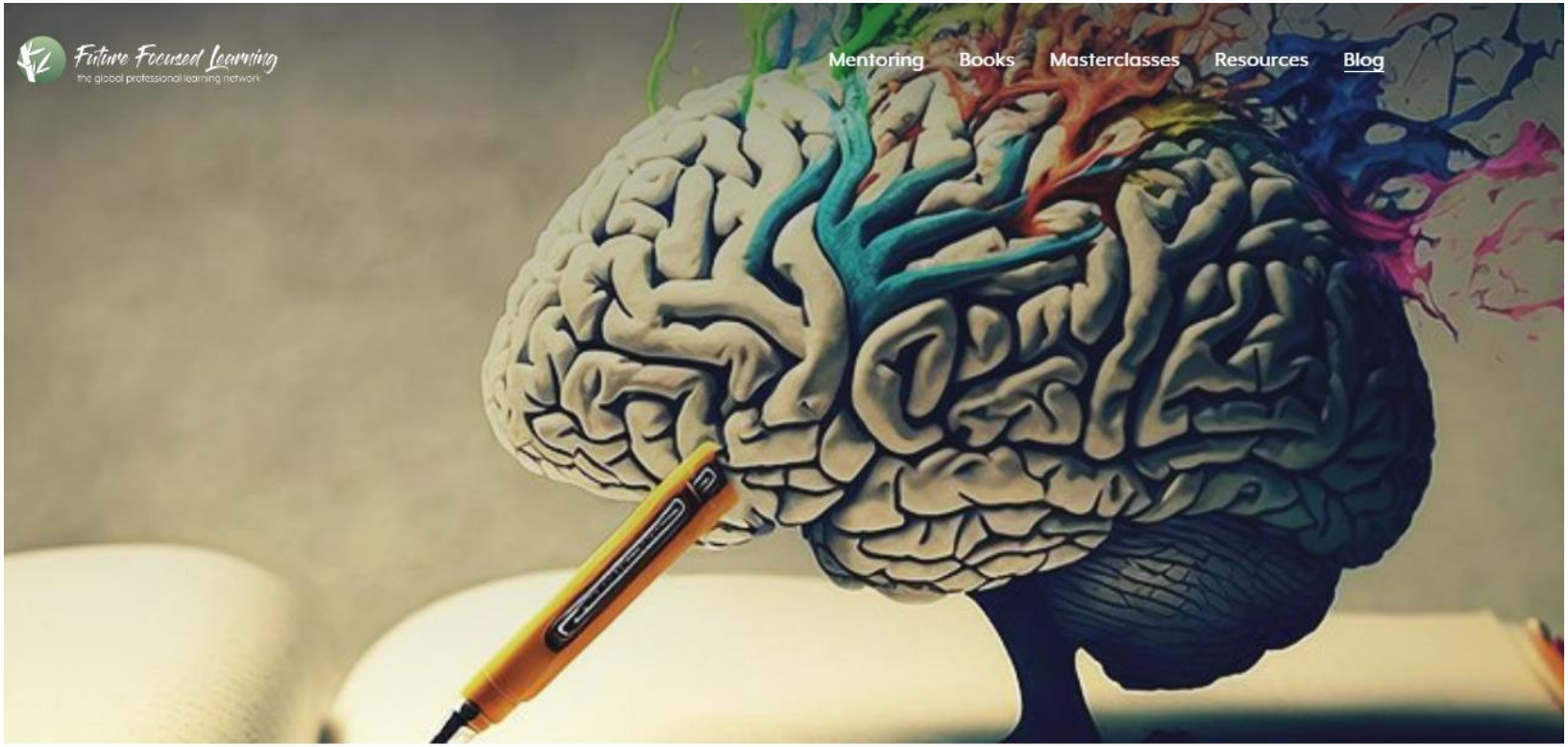


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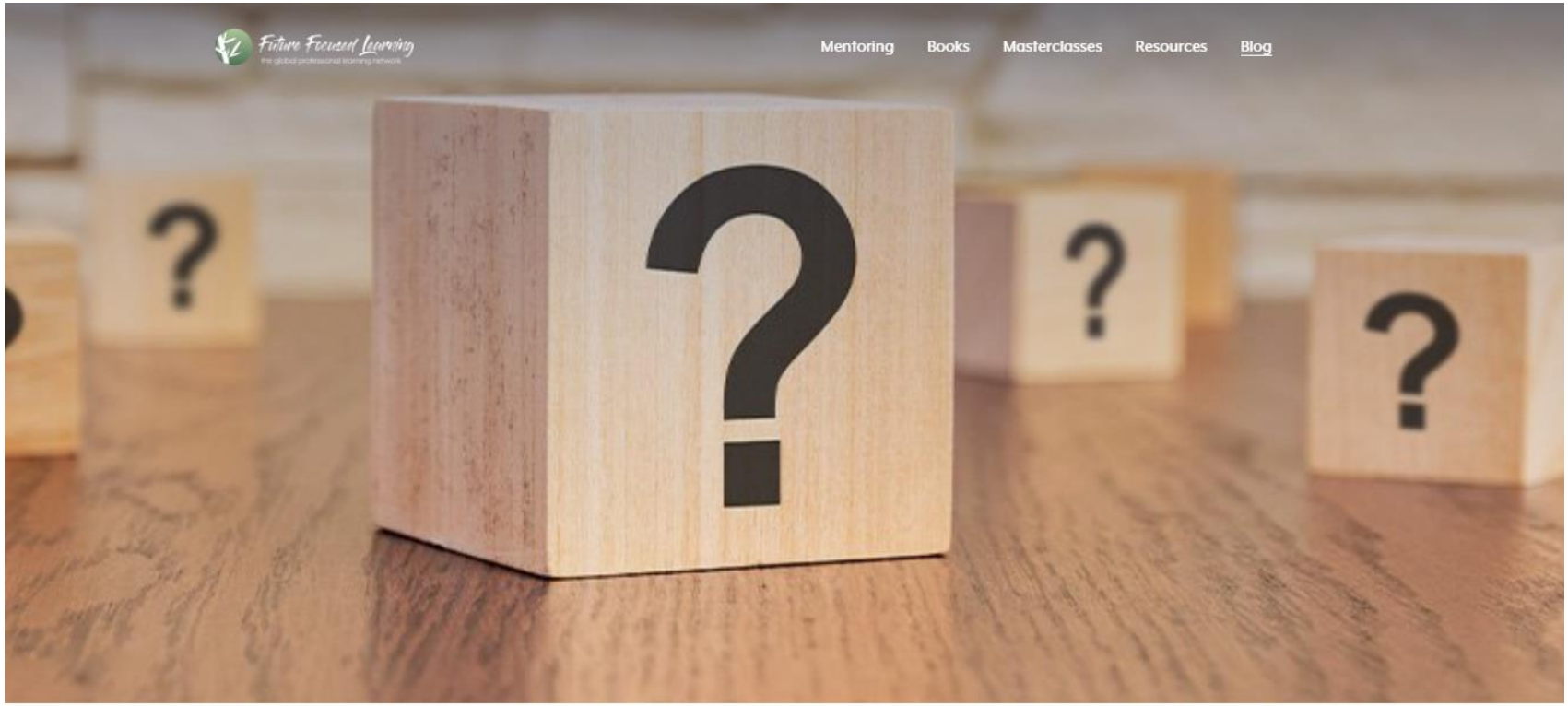


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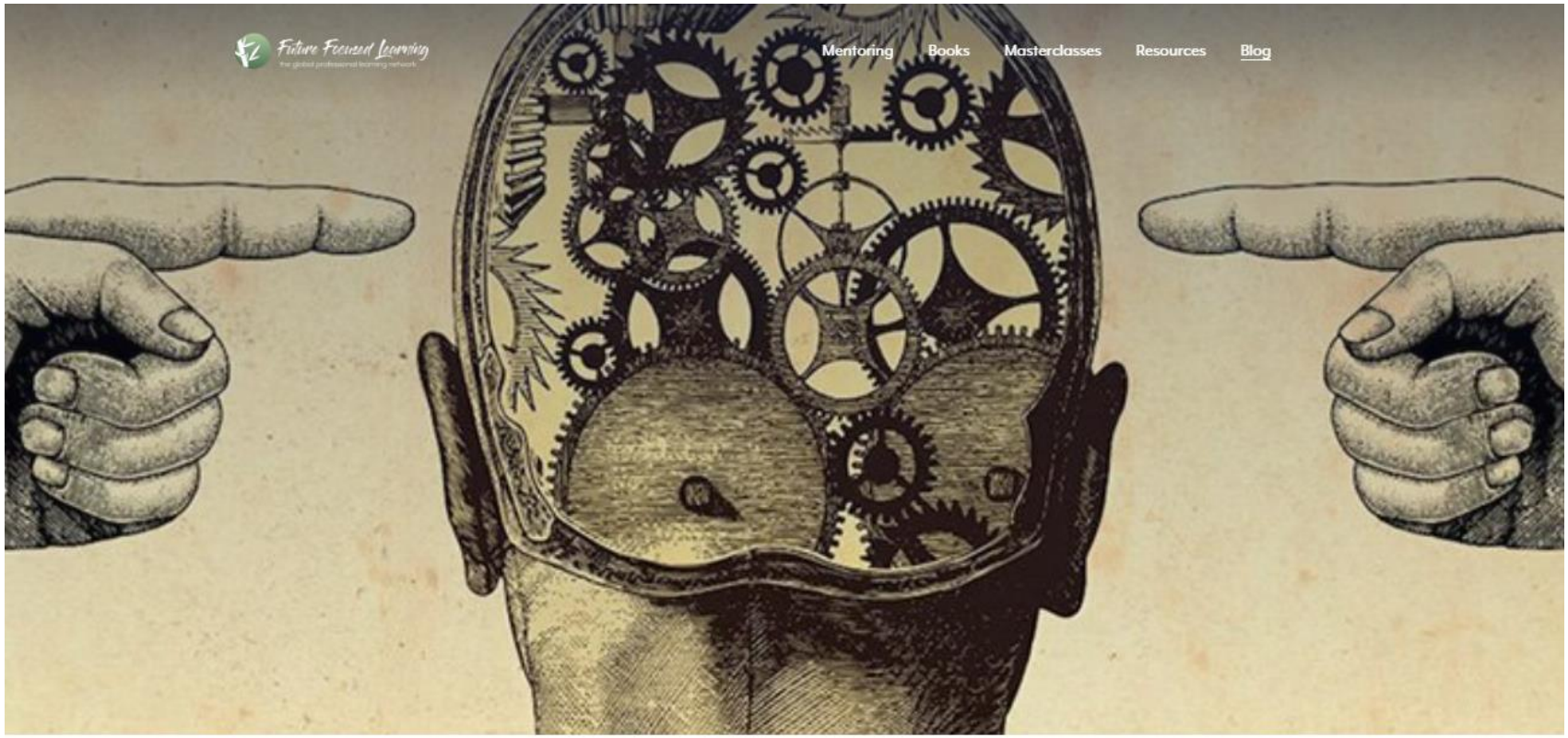


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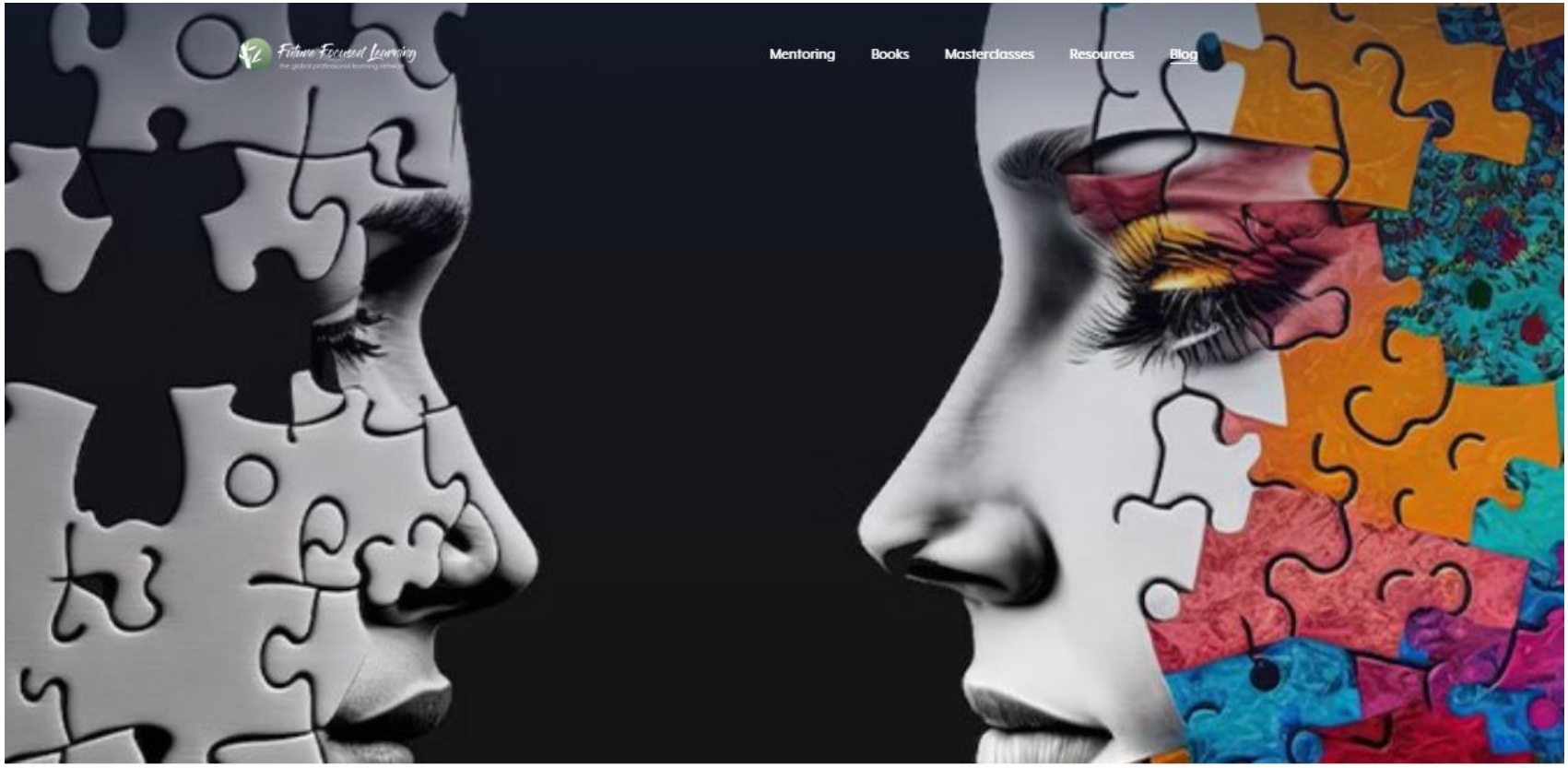


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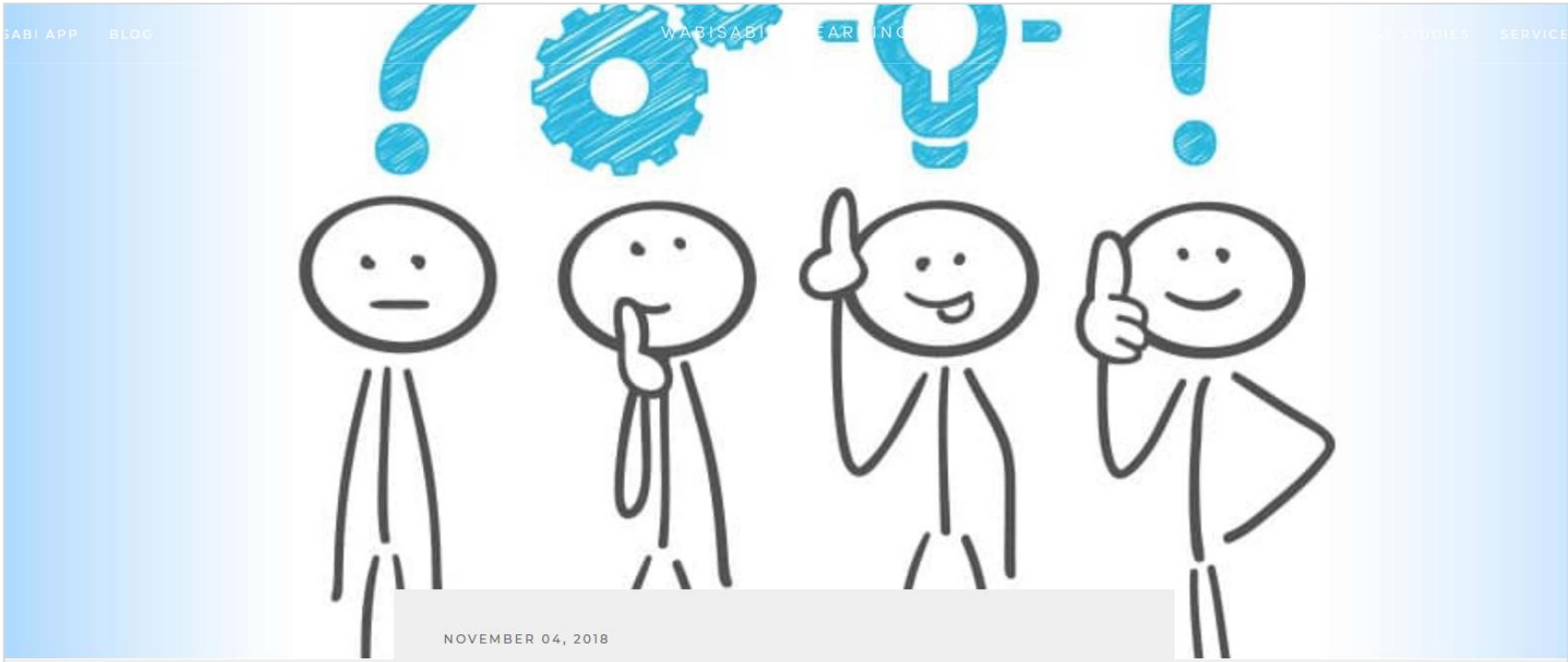


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Written By **Lee Crockett**

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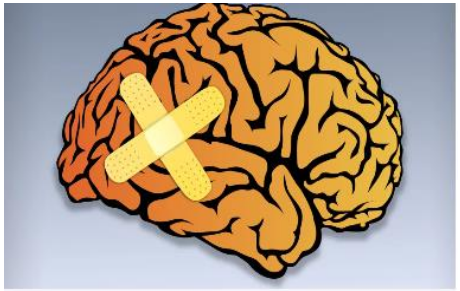

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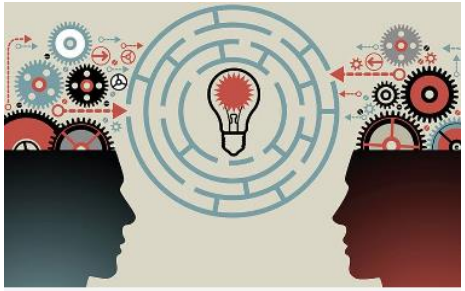

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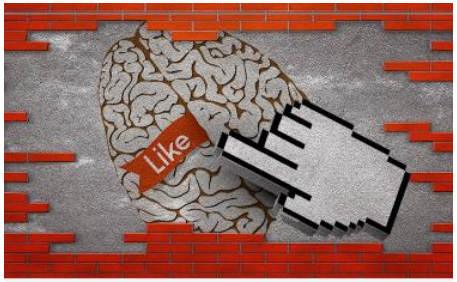


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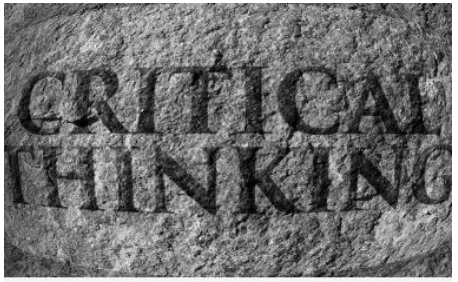


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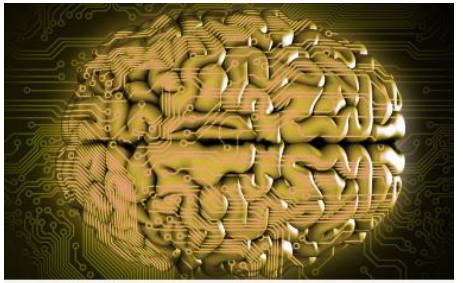

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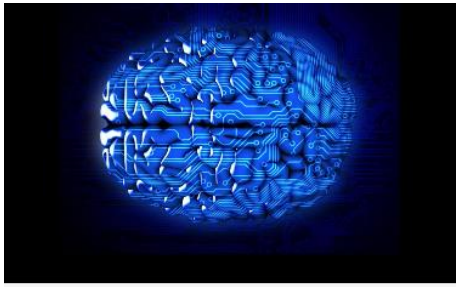

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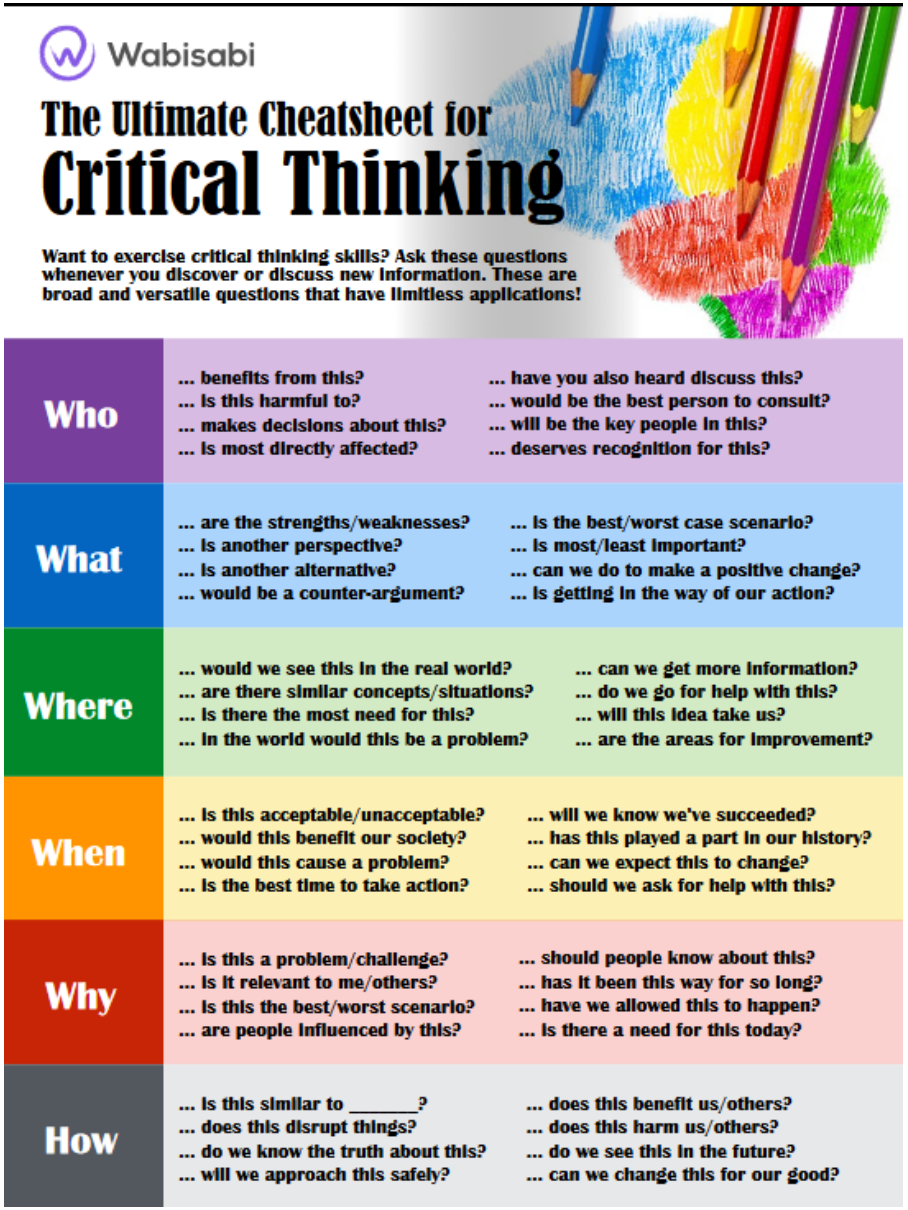


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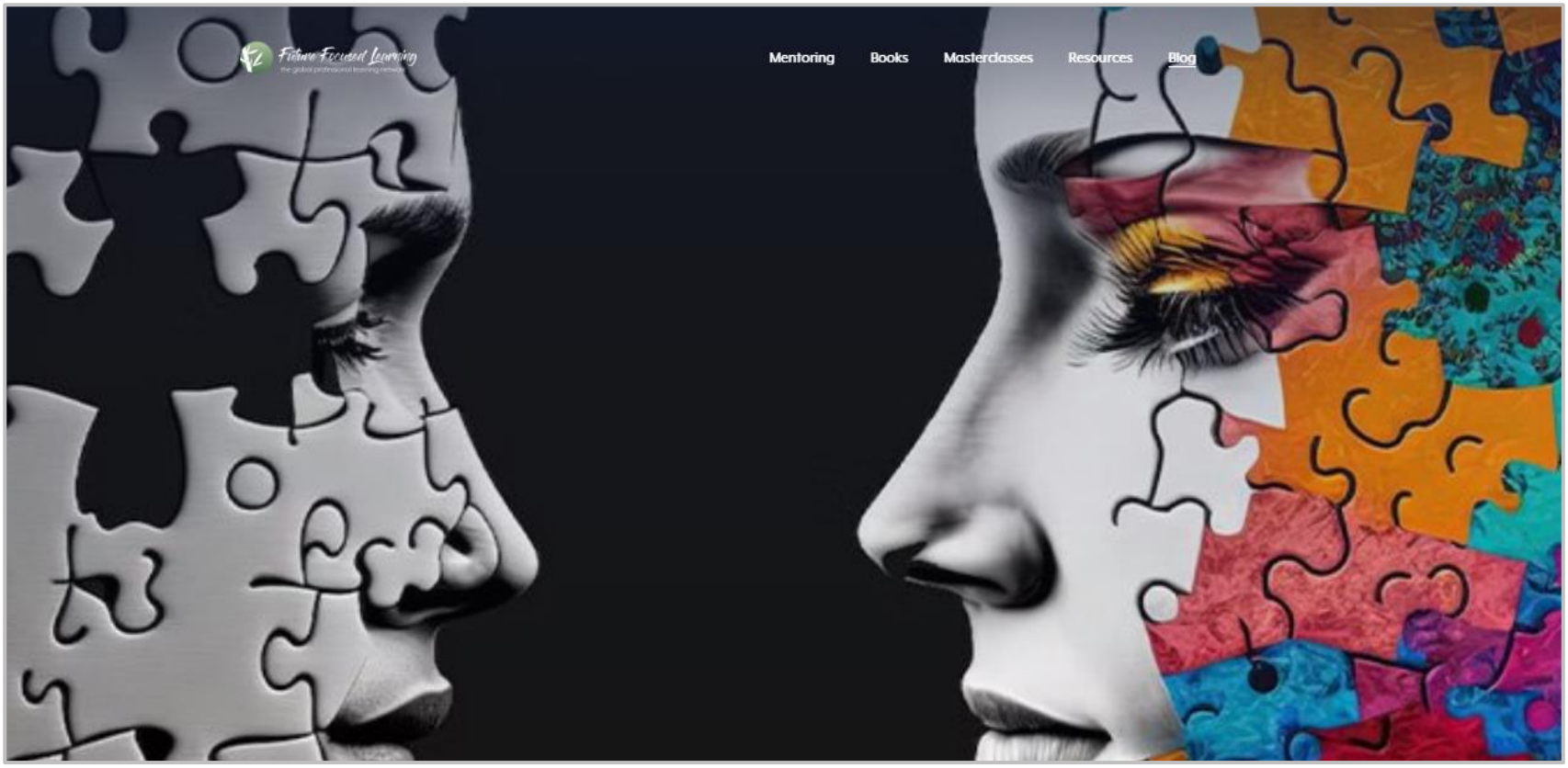


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# Critical Thinking

## 28 CRITICAL THINKING QUESTION STEMS FOR ANY CONTENT AREA

1. What evidence can you present for/against...?
2. How does ... contrast with ...?
3. How could you outline or concept map...? Explain your response with examples.
4. Why is ... significant? Explain your reasoning.
5. What are the advantages and disadvantages of ...?
6. What is the point or 'big idea' of ...?
7. How could you judge the accuracy of ...?
8. What are the differences between ... and ...?
9. How is ... related to ...?
10. What ideas could you add to ... and how would these ideas change it?
11. Describe ... from the perspective of ....
12. What do you think about ...? Explain your reasoning.
13. When might ... be most useful and why?
14. How could you create or design a new...? Explain your thinking.
15. What solutions could you suggest the problem of ...? Which might be most effective and why?
16. What might happen if you combined ... and ...?
17. Do you agree that ...? Why or why not?
18. What information would you need to make a decision about ...?
19. How could you prioritize ...?
20. How is ... an example of ...?
21. What are the most important parts or features of ...?
22. Which details of ... are most important and why?
23. What patterns do you notice in ...?
24. How could you classify ... into a more/less general category?
25. What makes ... important?
26. What criteria could you use to assess ...?
27. How could ... and ... function together? How do they work separately and together and different ways?
28. Where is ... most/least ...? Explain your reasoning.

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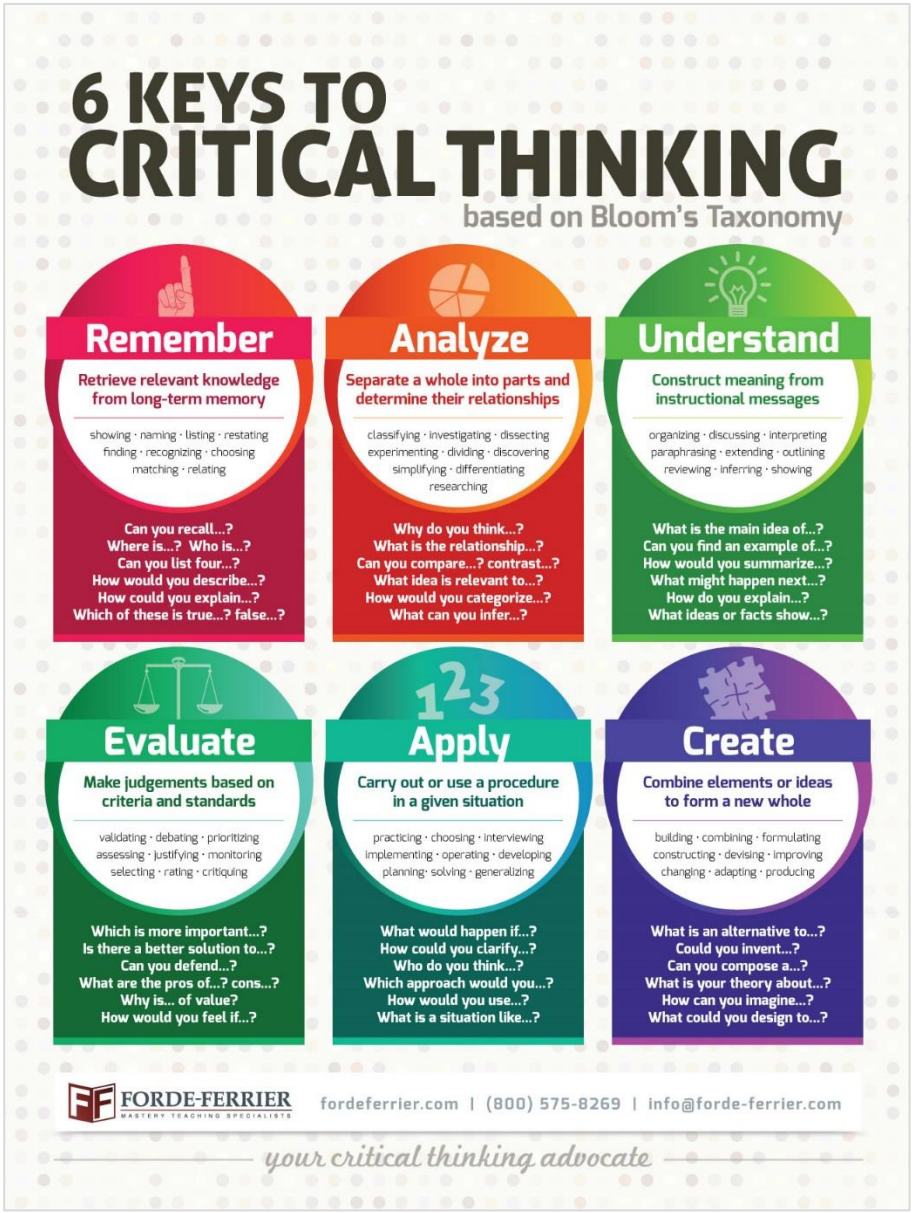


## REMEMBER

Retrieve relevant knowledge from long-term memory.

## ANALYZE

Separate a whole into parts and determine their relationships.

## UNDERSTAND

Construct meaning from instructional messages.

## EVALUATE

Make judgments based on criteria and standards.

## APPLY

Carry out or use a procedure in a given situation.

## CREATE

Combine elements or ideas to form a new whole.

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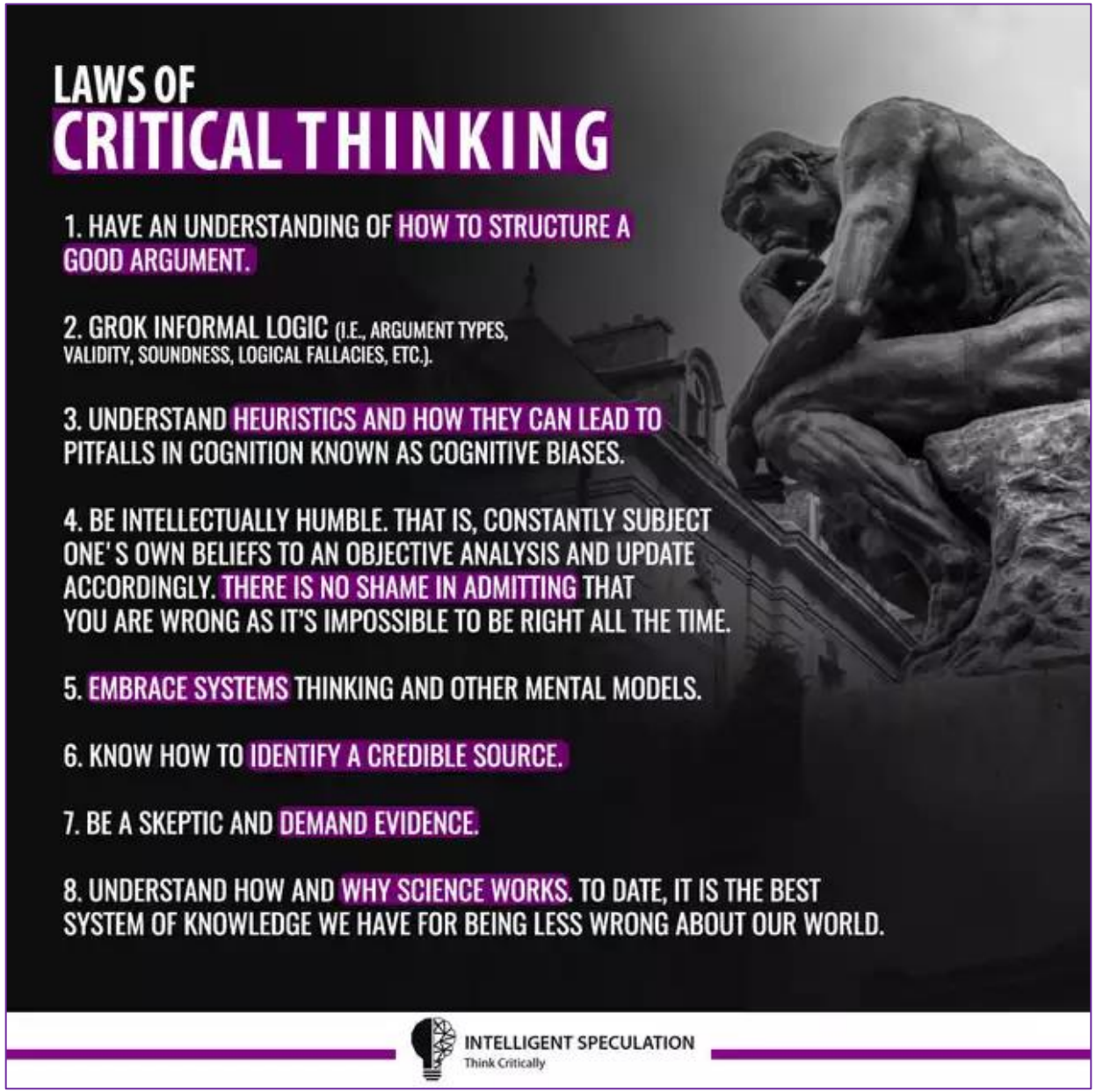


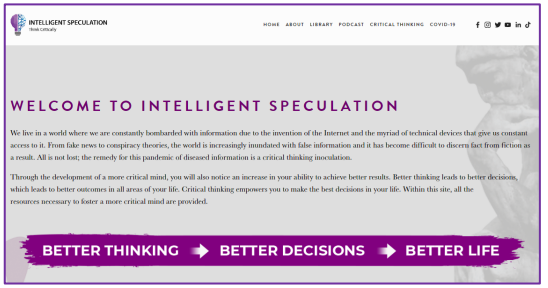


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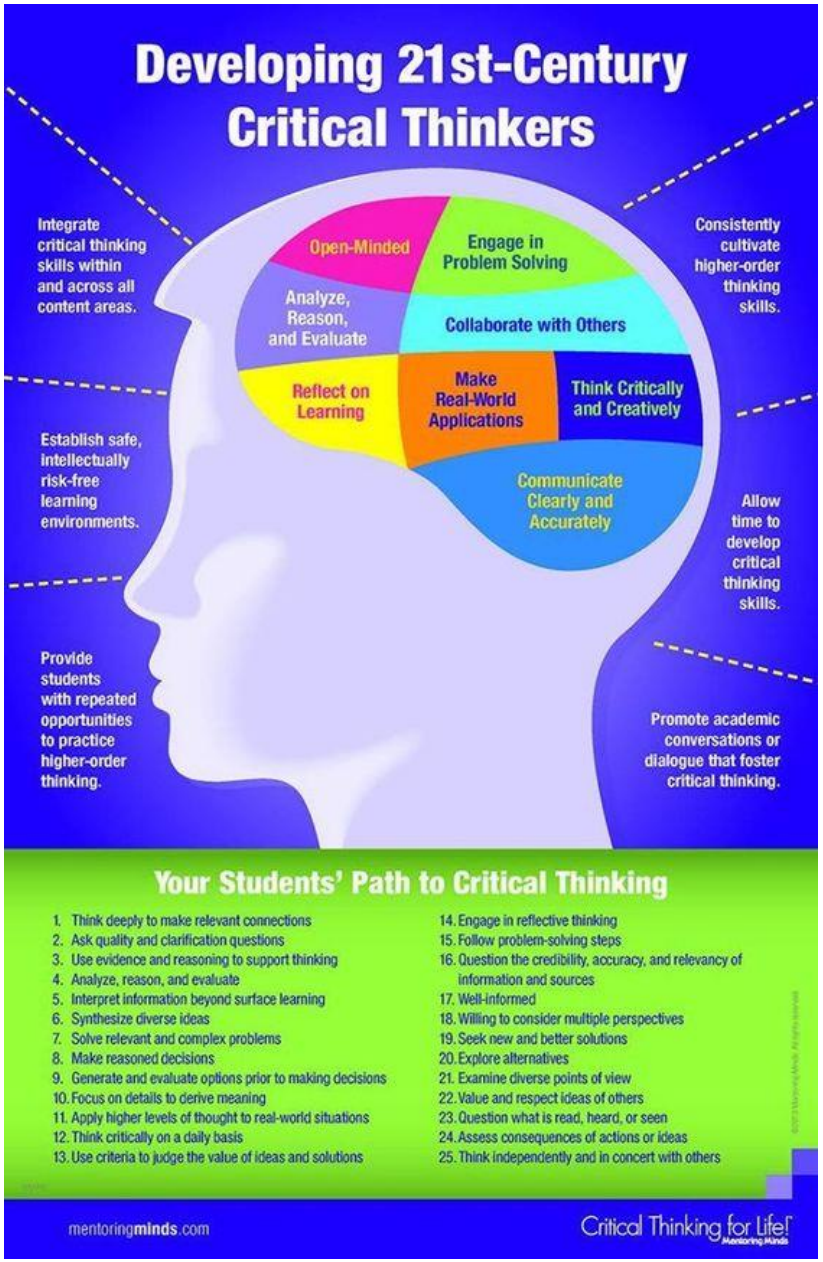

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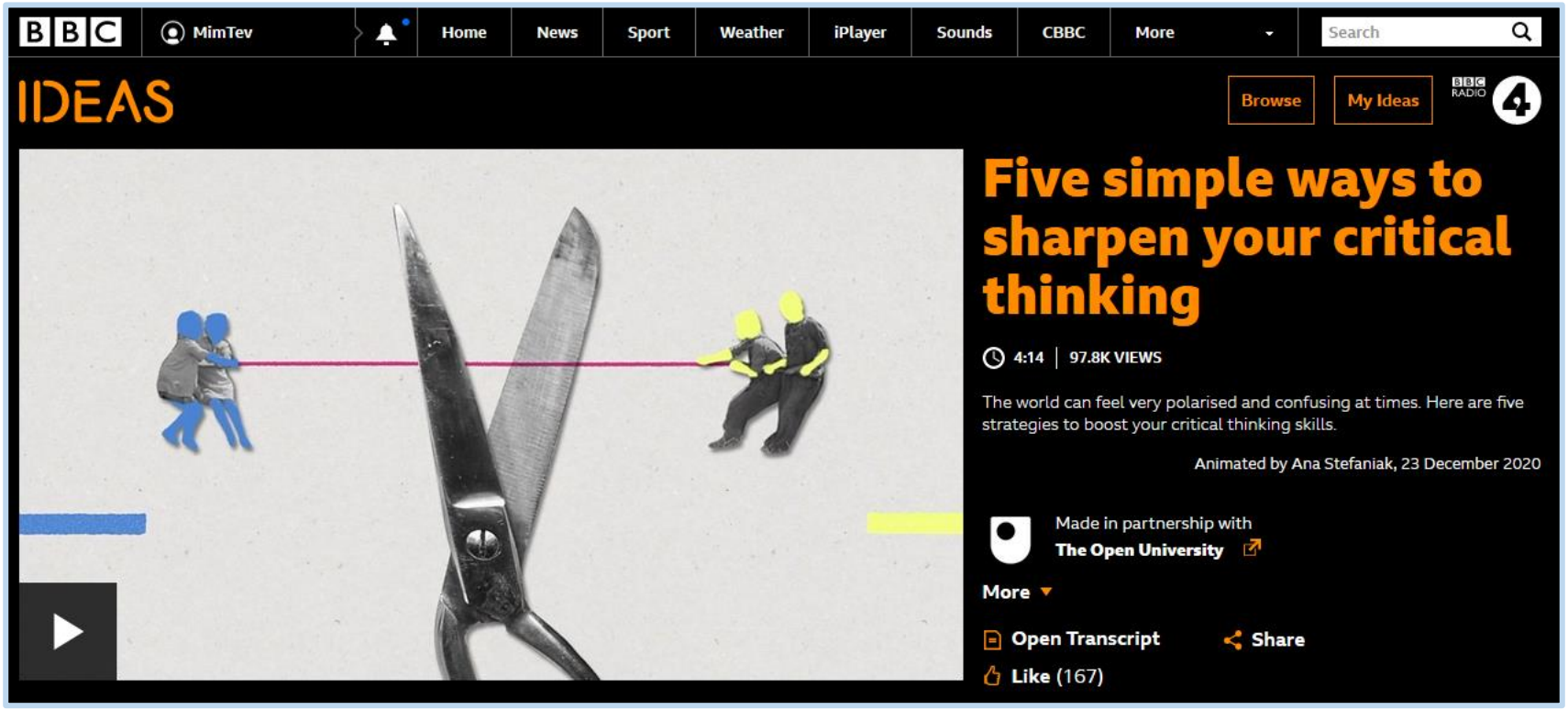


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# Critical Thinking Skills

Interpreting data

Applying facts and principles

Logical reasoning

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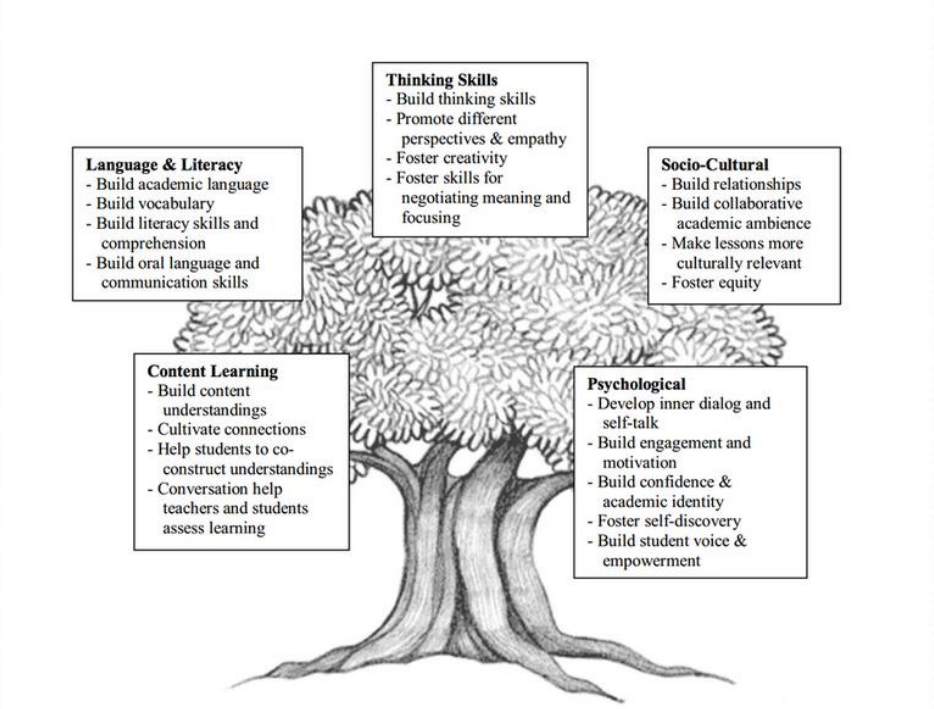
# Critical Thinking Skills

Competencies Academic Conversation Skills promote.

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# Critical Thinking Skills

| Questions to Fire Up Our Critical Thinking Skills | |
|---|---|
| **Interpretation** | • What does this mean?<br>• What's happening?<br>• How should we understand that (e.g., what he or she just said)?<br>• What is the best way to characterize/categorize/classify this?<br>• In this context, what was intended by saying/doing that?<br>• How can we make sense out of this (experience, feeling, or statement)? |
| **Analysis** | • Please tell us again your reasons for making that claim.<br>• What is your conclusion/What is it that you are claiming?<br>• Why do you think that?<br>• What are the arguments pro and con?<br>• What assumptions must we make to accept that conclusion?<br>• What is your basis for saying that? |
| **Inference** | • Given what we know so far, what conclusions can we draw?<br>• Given what we know so far, what can we rule out?<br>• What does this evidence imply?<br>• If we abandoned/accepted that assumption, how would things change?<br>• What additional information do we need to resolve this question?<br>• If we believed these things, what would they imply for us going forward?<br>• What are the consequences of doing things that way?<br>• What are some alternatives we haven't yet explored?<br>• Let's consider each option and see where it takes us.<br>• Are there any undesirable consequences that we can and should foresee? |
| **Evaluation** | • How credible is that claim?<br>• Why do we think we can trust what this person claims?<br>• How strong are those arguments?<br>• Do we have our facts right?<br>• How confident can we be in our conclusion, given what we now know? |
| **Explanation** | • What were the specific findings/results of the investigation?<br>• Please tell us how you conducted that analysis.<br>• How did you come to that interpretation?<br>• Please take us through your reasoning one more time.<br>• Why do you think that (was the right answer/was the solution)?<br>• How would you explain why this particular decision was made? |
| **Self-Regulation** | • Our position on this issue is still too vague; can we be more precise?<br>• How good was our methodology, and how well did we follow it?<br>• Is there a way we can reconcile these two apparently conflicting conclusions?<br>• How good is our evidence?<br>• OK, before we commit, what are we missing?<br>• I'm finding some of our definitions a little confusing; can we revisit what we mean by certain things before making any final decisions? |

Source: © 2014 User Manual for the *California Critical Thinking Skills Test*, published by Insight Assessment.

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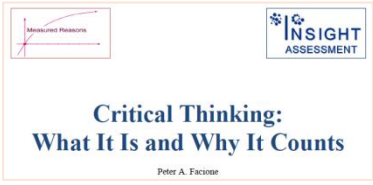

# Critical Thinking Skills

| Core Critical Thinking Skills | | |
|---|---|---|
| **SKILL** | **Experts' Consensus Description** | **Subskill** |
| **Interpretation** | "To comprehend and express the meaning or significance of a wide variety of experiences, situations, data, events, judgments, conventions, beliefs, rules, procedures, or criteria" | Categorize<br>Decode significance<br>Clarify meaning |
| **Analysis** | "To identify the intended and actual inferential relationships among statements, questions, concepts, descriptions, or other forms of representation intended to express belief, judgment, experiences, reasons, information, or opinions" | Examine ideas<br>Identify arguments<br>Identify reasons and claims |
| **Inference** | "To identify and secure elements needed to draw reasonable conclusions; to form conjectures and hypotheses; to consider relevant information and to reduce the consequences flowing from data, statements, principles, evidence, judgments, beliefs, opinions, concepts, descriptions, questions, or other forms of representation" | Query evidence<br>Conjecture alternatives<br>Draw logically valid or justified conclusions |
| **Evaluation** | "To assess the credibility of statements or other representations that are accounts or descriptions of a person's perception, experience, situation, judgment, belief, or opinion; and to assess the logical strength of the actual or intended inferential relationships among statements, descriptions, questions, or other forms of representation" | Assess credibility of claims<br>Assess quality of arguments that were made using inductive or deductive reasoning |
| **Explanation** | "To state and to justify that reasoning in terms of the evidential, conceptual, methodological, criteriological, and contextual considerations upon which one's results were based; and to present one's reasoning in the form of cogent arguments" | State results<br>Justify procedures<br>Present arguments |
| **Self-Regulation** | "Self-consciously to monitor one's cognitive activities, the elements used in those activities, and the results educed, particularly by applying skills in analysis, and evaluation to one's own inferential judgments with a view toward questioning, confirming, validating, or correcting either one's reasoning or one's results" | Self-monitor<br>Self-correct |

Source: APA Report: *Expert Consensus Statement on Critical Thinking*. (ERIC ED 315 423)

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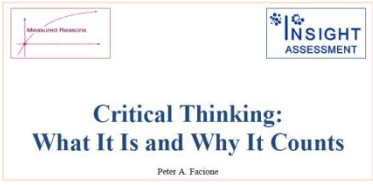
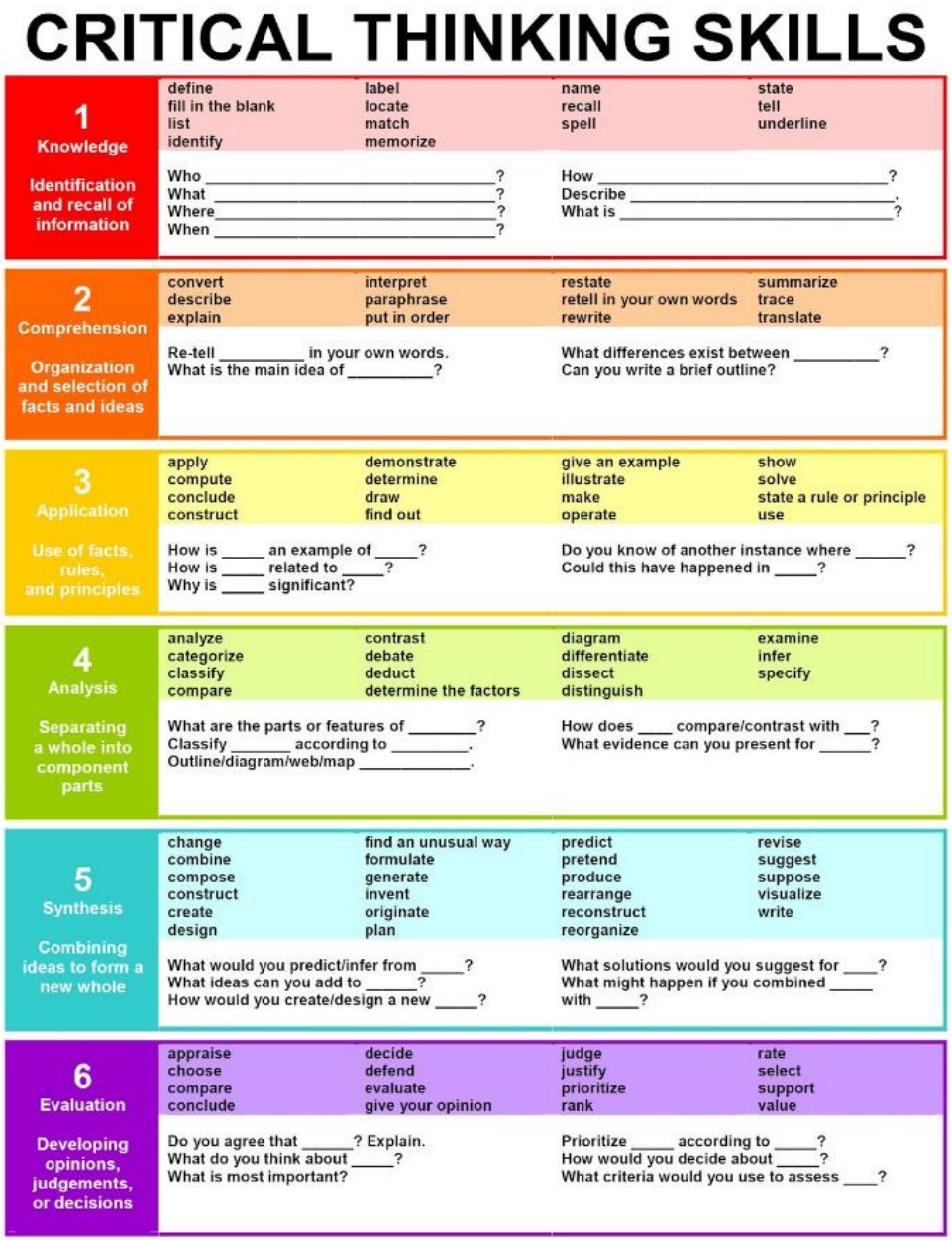


# Critical Thinking Skills

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# Critical Thinking Skills

INSIGHT ASSESSMENT

*Measuring Thinking Worldwide*

**Critical thinking is a process, a purposeful and reflective process of problem solving and decision making, aimed at making a reasoned judgment about what to believe or what to do. In forming this judgment a person employs their critical thinking skills. These skills are described in detail, with examples, in the 1990 APA Delphi Report which presented an expert consensus conceptualization of critical thinking.**

**Download the executive summary from http://www.insightassessment.com/CT-Resources/Expert-Consensus-on-Critical-Thinking/Delphi-Consensus-Report-Executive-Summary-PDF/%28language%29/eng-US**

**Here is Table 4 from the APA Delphi Report**

## CONSENSUS DESCRIPTIONS OF CORE CT SKILLS AND SUB-SKILLS

- **Interpretation**
- **Analysis**
- **Inference**
- **Explanation**
- **Evaluation**
- **Self-Regulation**


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# Critical Thinking Skills

INSIGHT ASSESSMENT

*Measuring Thinking Worldwide*

**2015 Update on the Critical Thinking Mindset from Delphi Report Principle Investigator, Dr. Peter Facione**

## The Starting Point: Excerpted from the 1990 APA Delphi Report

**TABLE 1**

**CONSENSUS STATEMENT REGARDING CRITICAL THINKING AND THE IDEAL CRITICAL THINKER**

We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair-minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.

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# Critical Thinking: Socratic Questions



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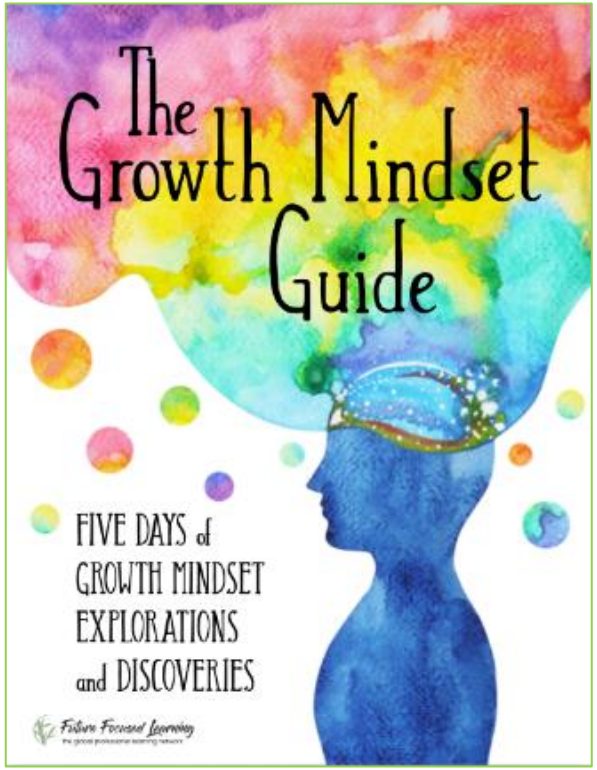
# The Importance of Mindset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# The Importance of Mindset


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## Growth mindset

**Course summary**

- Growth mindset content overview
- Elementary and middle school activities
- High school activities

### Growth mindset content overview

- Implementing the growth mindset in your classroom
- Elementary and middle school curriculum overview
- High school curriculum overview
- Growth mindset activity lesson plans

### Elementary and middle school activities

- Activity 1: The truth about your brain (ES/MS)
- Activity 2: The growth mindset (ES/MS)
- Activity 3: Mistakes as puzzle pieces (ES/MS)
- Activity 4: Keep going. Keep growing. (ES/MS)
- Activity 5: Supercharge your growth. (ES/MS)
- Activity 6: Supercharge your goals. (ES/MS)
- Activity 7: The path forward (ES/MS)
- Teacher Resources

### High school activities

- Activity 1: The truth about your brain (HS)
- Activity 2: The growth mindset (HS)
- Activity 3: Mistakes are opportunities. (HS)
- Activity 4: Keep going. Keep growing. (HS)
- Activity 5: Supercharge your goals. (HS)
- Activity 6: My kind of cool (HS)
- Activity 7: Serendipity (HS)
- Activity 8: The path forward (HS)
- Teacher Resources

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# The Importance of Mindset

# Critical Thinking

## *How Can You Check Yourself?*

### Critical Thinking Mindset Self-Rating Form

Answer yes or no to each. Can I ***name any specific instances over the past two days*** when I:

1. was courageous enough to ask tough questions about some of my longest held and most cherished beliefs?
2. backed away from questions that might undercut some of my longest held and most cherished beliefs?
3. showed tolerance toward the beliefs, ideas, or opinions of someone with whom I disagreed?
4. tried to find information to build up my side of an argument but not the other side?
5. tried to think ahead and anticipate the consequences of various options?
6. laughed at what other people said and made fun of their beliefs, values, opinion, or points of views?
7. made a serious effort to be analytical about the foreseeable outcomes of my decisions?
8. manipulated information to suit my own purposes?
9. encouraged peers not to dismiss out of hand the opinions and ideas other people offered?
10. acted with disregard for the possible adverse consequences of my choices?
11. organized for myself a thoughtfully systematic approach to a question or issue?
12. jumped in and tried to solve a problem without first thinking about how to approach it?
13. approached a challenging problem with confidence that I could think it through?
14. instead of working through a question for myself, took the easy way out and asked someone else for the answer?
15. read a report, newspaper, or book chapter or watched the world news or a documentary just to learn something new?
16. put zero effort into learning something new until I saw the immediate utility in doing so?
17. showed how strong I was by being willing to honestly reconsider a decision?
18. showed how strong I was by refusing to change my mind?
19. attended to variations in circumstances, contexts, and situations in coming to a decision?
20. refused to reconsider my position on an issue in light of differences in context, situations, or circumstances?

If you have described yourself honestly, this self-rating form can offer a rough estimate of what you think your overall disposition toward critical thinking has been in the past two days.

Give yourself 5 points for every "Yes" on odd numbered items and for every "No" on even numbered items. If your total is 70 or above, you are rating your disposition toward critical thinking over the past two days as generally positive. Scores of 50 or lower indicate a self-rating that is averse or hostile toward critical thinking over the past two days. Scores between 50 and 70 show that you would rate yourself as displaying an ambivalent or mixed overall disposition toward critical thinking over the past two days.

Interpret results on this tool cautiously. At best this tool offers only a rough approximation with regard to a brief moment in time. Other tools are more refined, such as the *California Critical Thinking Disposition Inventory*, which gives results for each of the seven critical thinking habits of mind.



For a fuller and more robust measure of critical thinking dispositions see the California Critical Thinking Disposition Inventory (CCTDI) by Facione and Facione, published in 1992, by Insight Assessment.

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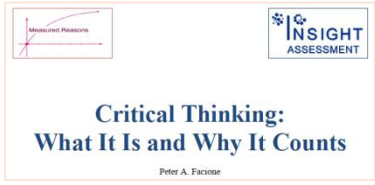

# Critical Thinking: Applications


## How to Survive the Misinformation Age: Skeptical Inquirer Takes on "Alternative Facts"

April 3, 2017

With the rise of fake news and "alternative facts," no publication is better suited than *Skeptical Inquirer* to serve as a survival manual for the wilderness of misinformation. In its latest issue, leading thinkers confront the storm of falsehoods and pseudoscience with practical strategies built on a foundation of facts.

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## What is critical thinking?

**Module topic:** Critical thinking skills

The ability to reason and find logical connections between ideas is vital in the decision-making process. This video gives a brief introduction to critical thinking. [Music: Perspectives - Kevin MacLeod (incompetech.com) Licensed under Creative Commons: By Attribution 3.0 License http://creativecommons.org/licenses/by/3.0/]

▾ **Develop this skill**

Find out more about applying critical thinking in your work from the document Critical thinking: Frequently asked questions.

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### Related videos

How do you draw your own conclusions on a topic?


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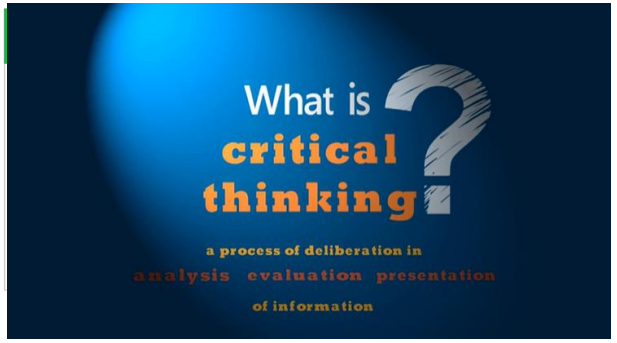
Assuming a causal connection

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Critical thinking skills

Module introduction

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- What is critical thinking?
- Critical reading and writing
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## Critical thinking skills

As you are exposed to new ideas and evidence, it becomes increasingly important to think critically about the information you are working with. This means questioning assumptions, evaluating the reliability of sources and evidence and comparing propositions. This section explains what critical thinking is, and how you can apply it to your learning.

### What is critical thinking?

Build your understanding of critical thinking techniques

Get Started

### My journal

Critical thinking skill... Edit

Maximise Save

View entries

### Practice activity

Practise your critical thinking

Practise evaluating evidence

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## Checking for bias in your sources

**Module topic:** Critical thinking skills

As part of critical thinking and evaluating evidence, this video explores the reasons why students should scrutinise the information that is presented to them. [Music: Funky Suspense - Bensound.com]

**Develop this skill**

Being able to critically analyse information is an important skill in everyday life as well as in academic settings. For example criteria to use when inspecting evidence and further advice on checking your sources, take a look at this document on Evaluating evidence: Frequently asked questions.

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# Critical Thinking: How to Develop





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## Study skills

Helping students develop the key skills they need to succeed in higher education.

Part- or full-time, distance learner or mature student, each method of study brings its own unique challenges and pressures. Stay sane and negotiate your way through the student maze of funding, work-life balance, special needs and career planning with our indispensable guides.

### Giving a talk or presentation

Few things cause as much grief to students as being told that they have to give a talk or presentation. Yet forms of oral assessment are becoming increasingly common in higher education, for good reasons. Oral communication skills are among the skills most valued by future employers. Yet according to the UK body Association for Graduate Recruiters, 64 per cent of employers claimed that these are just the skills graduates lack.

### Writing better essays

Two pieces on how to ensure your written work is presented as clearly and correctly as possible. This guide includes grammar and punctuation, and an appropriate writing style.

### Getting organized

For many new students one of the most challenging aspects of the transition from school to a college or university environment is learning how to take responsibility for and manage their own time and studies. Days are less structured and more is expected of undergraduates in terms of working independently, to find and absorb the information they need. And, of course, there are far more distractions than there were back at home...

### Effective note taking

Being able to take clear comprehensive notes, which allow you to understand and learn the presented material for your course assignments or exams, is a vital skill for students at college or university. It can also be a major challenge is you are coming up from school without having had to make your own notes on what was happening in class. The following are simple ideas for creating useful and effective notes from which you can learn more easily.

### Filing for beginners

For everyone who wasn't fortunate enough to be born organized, here are some simple tips and advice on how to gain control of your paperwork and bring some order back to your life.

### Mind maps

The traditional way of taking notes, whether for a lecture or when reading a book, is to follow the chronological sequence of the author's thought, and to summarize the content of the book or lecture, often using sentences and phrases instead of just key words. An alternative approach, and one which some claim works with both halves of the brain by harnessing its powers of visualization and association, and thereby improves both memory and creative thinking, is mind mapping.

### Developing critical thinking

The ability to think critically is a key skill for academic success. It means not taking what you hear or read at face value, but using your critical faculties to weigh up the evidence, and considering the implications and conclusions of what the writer is saying.

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# Critical Thinking: How to Develop

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## CRITICAL THINKING


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- **Critical thinking**
- Critical and analytical thinking skills
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Written By **Lee Crockett**

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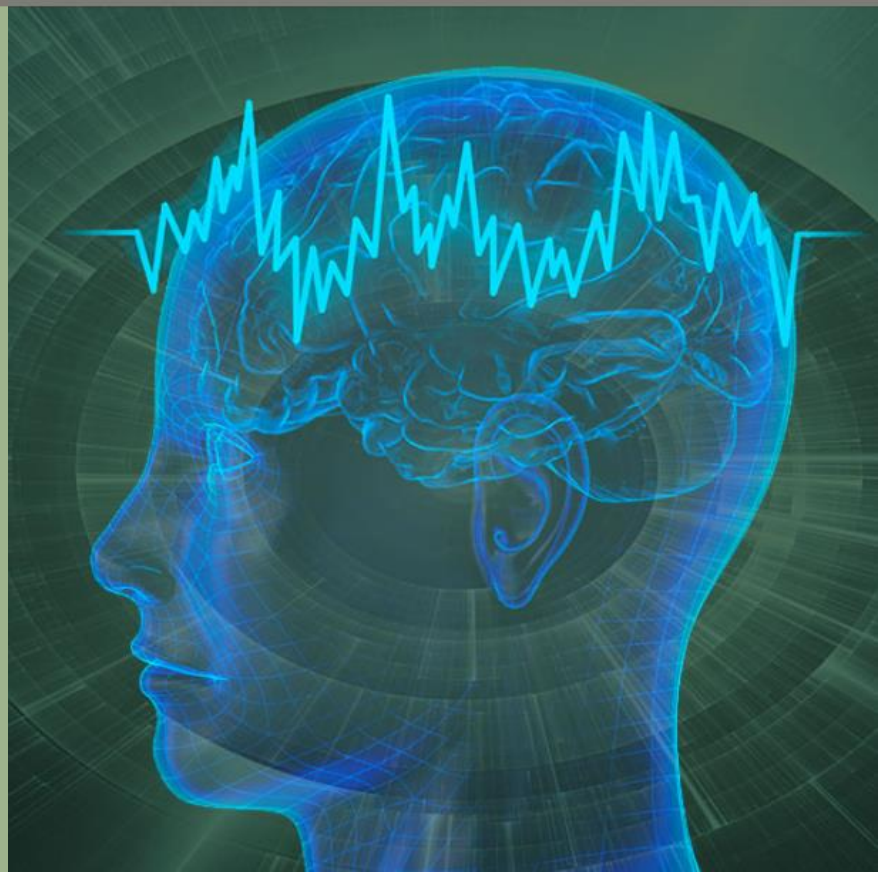
## How to Improve Critical Thinking Using a Simple 5-Step Process

Written By **Lee Crockett**

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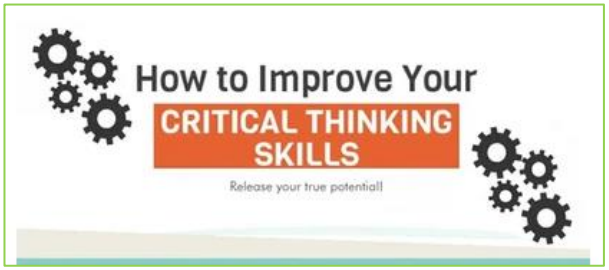



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Source: http://www.wikihow.com/Improve-Critical-Thinking-Skills

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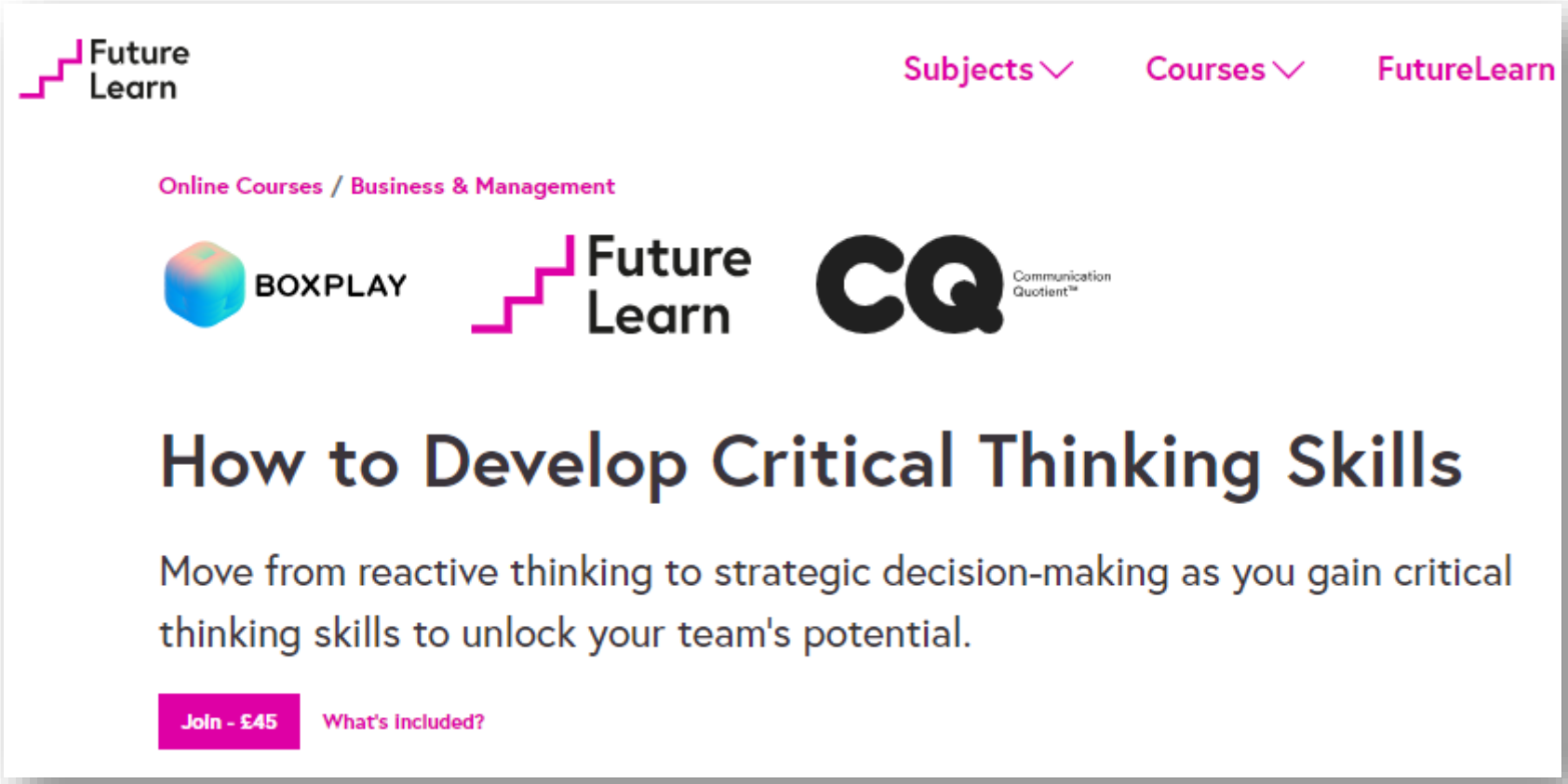


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# Critical Thinking

## Can Case Studies Be Used to Teach Critical Thinking?

*Clyde Freeman Herreid*

**If I had to choose one general characteristic that cuts across smart people it would be scepticism - the ability to ask oneself and others if the conclusions and data are correct. Smart people silently or openly say, "What is the evidence for this or that idea? Why should I believe this? Are there other explanations for the data? Is there another way to explain the data? What do you mean when you say this?" If you routinely ask such questions, even when dealing with subjects out of your own area of expertise, you will be well off. Certainly, this is true in the political arena. We have just had a terrible brouhaha -fiasco, is more like it -over the war in Iraq.**

This brings me to case studies. If reading, arguing, and challenging are hallmarks of critical thinking, then case studies are the poster children for the process. Most of them are discipline specific rtainly. But

### Best-Case Scenario

The best case technique that I know is one called the "Interrupted Case Method." Readers can see a version of it on the National Center for Case Study Teaching in Science website, titled "Mom Always Liked You Best." The method begins when the teache gives students (ideally

see model behavior from the experts. I love this method because it is the way real science works—we have to work with incomplete data, make tentative hypotheses, collect more information, refine our hypotheses, make more predictions, get more data, and so on. In fact, this interrupted method is very one that I

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# Critical Thinking at Job Interviews

**Don't be obsessed with 'threshold qualities' (*) that are the minimum requirements to be eligible for a job; it is '*sine non qua*' qualities, the indispensable and essential ones, that will get you the job (and a good job).**

**Critical thinking, problem solving, and creativity are the most important '*sine non qua*' qualities.**

**(*) A good degree / transcript (all applicants will have these)**

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# Critical Thinking at Job Interviews

## 7 Interview Brainteasers to Assess Your Interviewee's Critical Thinking

BY CHARLES TRIVETT

### Why use brainteasers?

Generally, the best hires are those who can identify problems quickly and solve them efficiently.

Critical thinking brainteasers have been created to assess candidates on the following key skills...

– **Problem Solving.** Can they at least attempt to solve problems as they arise? You don't want an employee who keeps running to you, every time something goes even slightly wrong.

– **Analysis.** Can they look at the big picture and analyse all the available information to find a solution? You don't want an employee who continuously overlooks important considerations.

– **Creativity.** Do they think outside the box? Sometimes, all it takes is a little bit of creative thinking so you don't want an employee, constrained by the 'rules' (not all the time, anyway!)

– **Performance under pressure.** These questions will probably be completely out of the candidate's comfort zone and it's unlikely that they'll have prepared for them. Can they keep it together?

### 1. The pizza puzzle.

**Q1. "If you were a pizza delivery man, how would you benefit from scissors?"**

### 2. A calculated question.

**Q2. "How would test a calculator?"**

### 3. Apples and pears.

**Q3. "An apple costs 40 cents, a banana costs 60 cents and a grapefruit costs 80 cents. How much does a pear cost?"**

### 4. What do a fox, a hen and a farmer have in common?

**Q4. "A farmer needs to cross the river with his chicken, a sack of corn and a fox.**

His boat unfortunately only fits himself and one other thing.

The fox and chicken are hungry, so if he leaves the fox with the chicken, the chicken will get eaten, whilst if he leaves the chicken with the corn, the corn will get eaten.

How will the man get safely across with all 3?"

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### 5. Number crunchers.

**Q5. "How many potatoes (in kg) does McDonald's sell in a year in the UK?"**

### 6. One to really catch them out!

**Q6. "Tracy's mother had 4 children. The first child was named April, the second was named May, the third June. What was the 4th child called?"**

### 7. That age-old question.

**Q7. "How do you know if the light inside the fridge is on or off?"**

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# Critical Thinking at Job Interviews

## Do critical thinking skills give graduates the edge?

It has long been claimed that critical thinking ability sets graduates apart. But are universities really preparing students for the modern workplace? David Matthews reports

**Think fast: what do graduate recruitment tests actually involve?**

Having taken several of the bespoke tests that firms are now using to put their graduate applicants through their paces, it's probably fair to say that I shouldn't give up the day job. But I suspect that I am not the only degree-holder who would struggle: the tests assess skills rather different from those required to pass university exams. Some questions involve numbers, shapes or text, but all are broadly designed to gauge mental agility. In abstract reasoning tests, for example, a typical question features a sequence of shapes, which you are asked to continue. Circle, square, circle, square: what next? That's easy – but the patterns quickly get a lot more complex than that.

Another spatial reasoning test designed for recruiters by specialist firm Saville Assessments involves rotating 3D shapes in your head to see which is the odd one out. Meanwhile, a verbal reasoning section requires you to speed-read a passage about eating habits – putting any emotional or critical reaction out of your mind – and then click on the best summary of it, or choose the best synonym to replace a word. Worryingly for a journalist, I completely flunk error-checking, which involves scanning a spreadsheet at a furious pace.

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# Critical Thinking at Job Interviews

## Do critical thinking skills give graduates the edge?

It has long been claimed that critical thinking ability sets graduates apart. But are universities really preparing students for the modern workplace? David Matthews reports

It is the rapid-fire nature of the tests that most distinguishes them from university work. You rarely have more than 30 seconds to answer a question; in some cases, you have little more than 10 seconds. It's a different form of mental activity from, say, crafting a dissertation over many months.

But perhaps the skills that these tests assess – can you quickly skim a paragraph or a screen of numbers, and then fire off an acceptable answer? – are more useful in the modern, time-pressed office than the sustained thought that higher education is supposed to -inculcate.

That said, it is important to note that the tests aren't used in isolation. Situational judgement tests, where applicants are presented with a real-world dilemma, are also increasingly in vogue. A candidate might be asked, for instance, how they would handle a situation in which a more senior colleague was suddenly called away and they were left having to meet clients. Given a list of five choices, 'there's probably an ideal answer', but it's 'quite nuanced'.

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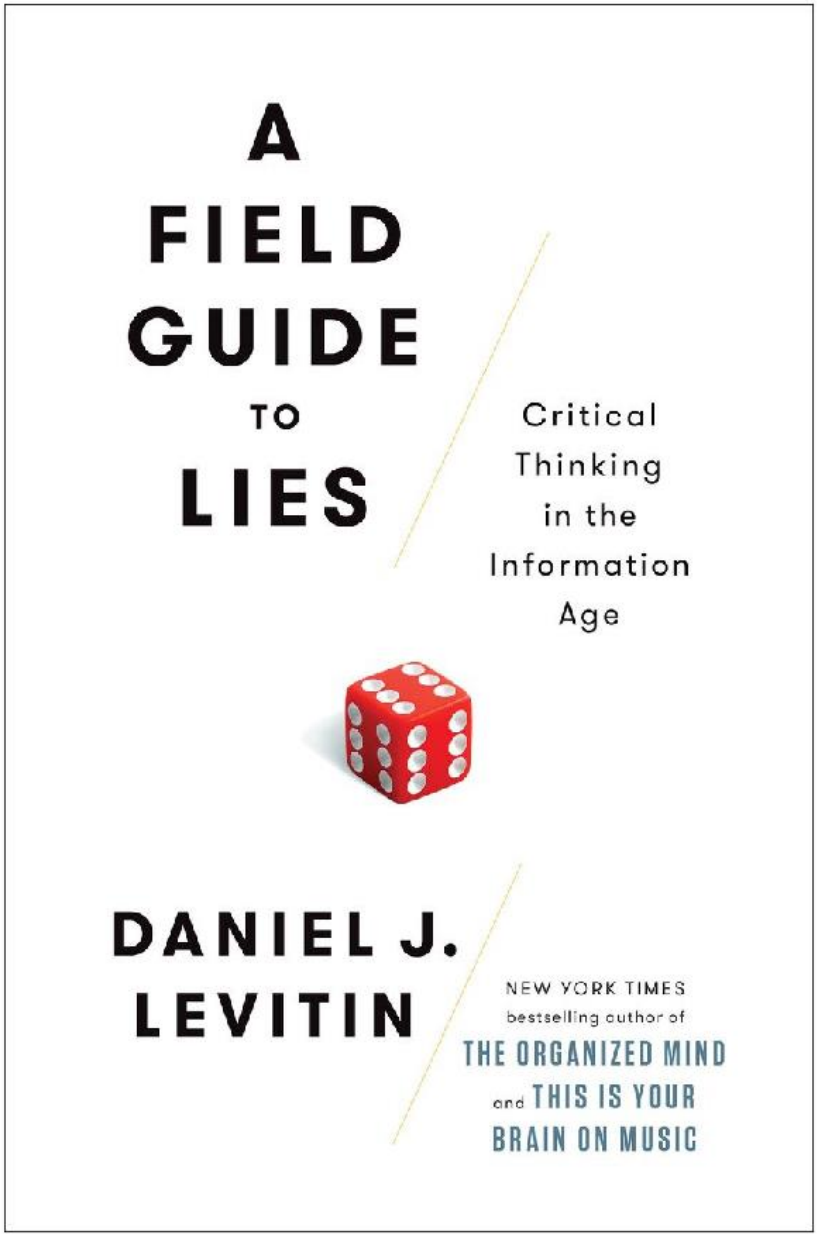
# Critical Thinking in the Information Age

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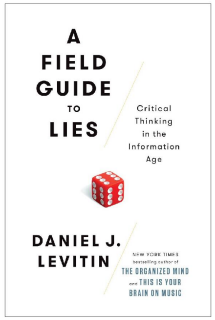
# Critical Thinking in the Information Age




## Logical Fallacies

### Illusory Correlation

The brain is a giant pattern detector, and it seeks to extract order and structure from what often appear to be random configurations. We see Orion the Hunter in the night sky not because the stars were organized that way but because our brains can project patterns onto randomness.

When that friend phones you just as you're thinking of them, that kind of coincidence is so surprising that your brain registers it. What it doesn't do such a good job of is registering all the times you *didn't* think of someone and they called you. You can think of this like one of those fourfold tables from Part One. Suppose it's a particularly amazing week filled with coincidences (a black cat crosses your path as you walk by a junkyard full of broken mirrors, make your way up to the thirteenth floor of a building to find the movie *Friday the 13th* playing on a television set there). Let's say you get twenty phone calls that week and two of them were from long-lost friends whom you hadn't thought about for a while, but they called within ten minutes of you thinking of them. That's the top row of your table: twenty calls, two that you summoned using extrasensory signaling, eighteen that you didn't. But wait! We have to fill in the bottom row of the table: How many times were you thinking about people and they *didn't* call, and—here's my favorite—how many times were you *not* thinking about someone and they didn't call?

**Was I Thinking About Them Just Before?**

| | | YES | NO | |
|---|---|---|---|---|
| **Someone Phoned** | YES | 2 | 18 | 20 |
| | NO | 50 | 930 | 980 |
| | | 52 | 948 | 1,000 |

To fill out the rest of the table, let's say there are 52 times in a week that you're thinking about people, and 930 times in a week when you are not thinking about people. (This last one is just a crazy guess, but if we divide up the 168-hour week into ten-minute increments, that's about 980 total thoughts, and we already know that 50 of those were about people who didn't phone you, leaving 930 thoughts about things other than people; this is probably an underestimate, but the point is made with any reasonable number you care to put here—try it yourself.)

The brain really only notices the upper left-hand square and ignores the other three, much to the detriment of logical thinking (and to the encouragement of magical thinking). Now, before you book a trip to Vegas to play the roulette wheel, let's run the numbers. What is the probability that someone will call *given* that you just thought about them? It's only two out of fifty-two, or 4 percent. That's right, 4 percent of the time when you think of someone they call you. That's not so impressive.

What might account for the 4 percent of the times when this coincidence occurs? A physicist might just invoke the 1,000 events in your fourfold table and note that only two of them (two-tenths of 1 percent) appear to be "weird" and so you should just expect this by chance. A social psychologist might wonder if there was some external event that caused both you and your friend to think of each other, thus prompting the call. You read about the terrorist attacks in Paris on November 13, 2015. Somewhere in the back of your mind, you remember that you and a college friend always talked about going to Paris. She calls you and you're so surprised to hear from her you forget the Paris connection, but she is reacting to the same event, and that's why she picked up the phone.

If this reminds you of the twins-reared-apart story earlier, it should. Illusory correlation is the standard explanation offered by behavioral geneticists for the strange confluence of behaviors, such as both twins scratching their heads with their middle finger, or both wrapping tape around pens and pencils to improve their grip. We are fascinated by the contents of the upper left-hand cell in the fourfold table, fixated on all the things that the twins do in common. We tend to ignore all the things that one twin does and the other doesn't.

### Framing of Probabilities

After that phone call from your old college friend, you decide to go to Paris on vacation for a week next summer. While standing in front of the *Mona Lisa*, you hear a familiar voice and look up to see your old college roommate Justin, whom you haven't seen in years. "I can't believe it!" Justin says. "I know!" you say. "What are the odds that I'd run into you here in Paris, standing right in front of the *Mona Lisa*! They must be millions to one!"

Yes, the odds of running into Justin in front of the *Mona Lisa* are probably millions to one (they'd be difficult to calculate precisely, yet any calculation you do would make clear that this was very unlikely). But this way of framing the probability is fallacious. Let's take a step back. What if you hadn't run into Justin just as you were standing in front of the *Mona Lisa*, but as you were in front of the *Venus de Milo*, in *les toilettes*, or even as you were walking in the entrance? What if you had run into Justin at your hotel, at a café, or the Eiffel Tower? You would have been just as surprised. For that matter, forget about Justin—if you had run into *anyone you knew* during that vacation, *anywhere in Paris,* you'd be just as surprised. And why limit it to your vacation in Paris? It could be on a business trip to Madrid, while changing planes in Cleveland, or at a spa in Tucson. Let's frame the probability this way: Sometime in your adult life, you'll run into someone you know where you wouldn't expect to run into them. Clearly the odds of that happening are quite good. But the brain doesn't automatically think this way—cognitive science has shown us just how necessary it is for us to train ourselves to avoid squishy thinking.

### Framing Risk

A related problem in framing probabilities is the failure to frame risks logically. Even counting the airplane fatalities of the 9/11 attacks in the United States, air travel remained (and continues to remain) the safest transportation mode, followed closely by rail transportation. The chances of dying on a commercial flight or train trip are next to zero. Yet, right after 9/11, many U.S. travelers avoided airplanes and took to the highways instead. Automobile deaths increased dramatically. People followed their emotional intuition rather than a logical response, oblivious to the increased risk. The *rate* of vehicular accidents did not increase beyond baseline, but the sum of people who died in all transportation-related accidents increased as more people chose a less safe mode of travel.

You might pull up a statistic such as this one:

> More people died in plane crashes in 2014 than in 1960.

From this, you might conclude that air travel has become much less safe. The statistic is correct, but it's not the statistic that's relevant. If you're trying to figure out how safe air travel is, looking at the total number of deaths doesn't tell you that. You need to look at the death *rate*—the deaths per miles flown, or deaths per flight, or something that equalizes the baseline. There were not nearly as many flights in 1960, but they were more dangerous.

By similar logic, you can say that more people are killed on highways between five and seven p.m. than between two and four a.m., so you should avoid driving between five and seven. But the simple fact is that many times more people are driving between five and seven—you need to look at the *rate* of death (per mile or per trip or per car), not the raw number. If you do, you'll find that driving in the evening is safer (in part because people on the road between two and four a.m. are more likely to be drunk or sleep-deprived).

After the Paris attacks of November 13, 2015, CNN reported that at least one of the attackers had entered the European Union as a refugee, against a backdrop of growing anti-refugee sentiment in Europe. Anti-refugee activists had been calling for stricter border control. This is a social and political issue and it is not my intention to take a stand on it, but the numbers can inform the decision making. Closing the borders completely to migrants and refugees might have thwarted the attacks, which took roughly 130 lives. Denying entry to a million migrants coming from war-torn regions such as Syria and Afghanistan would, with great certainty, have cost thousands of them their lives, far more than the 130 who died in the attacks. There are other risks to both courses of action, and other considerations. But to someone who isn't thinking through the logic of the numbers, a headline like "One of the attackers was a refugee" inflames the emotions around anti-immigrant sentiment, without acknowledging the many lives that immigration policies saved. The lie that terrorists want you to believe is that you are in immediate and great peril.

Misframing is often used by salespeople to persuade you to buy their products. Suppose you get an email from a home-security company with this pitch: "Ninety percent of home robberies are solved with video provided by the homeowner." It sounds so empirical. So scientific.

Start with a plausibility check. Forget about the second part of the sentence, about the video, and just look at the first part: "Ninety percent of home robberies are solved . . ." Does that seem reasonable? Without looking up the actual statistics, just using your real-world knowledge, it seems doubtful that 90 percent of home robberies are solved. This would be a fantastic success rate for any police department. Off to the Internet. An FBI page reports that about 30 percent of robbery cases are "cleared," meaning solved.

So we can reject as highly unlikely the initial statement. It said 90 percent of home robberies are solved with video provided by the homeowner. But that can't be true—it would imply that more than 90 percent of home robberies are solved, because some are certainly solved without home video. What the company more likely means is that 90 percent of solved robberies are from video provided by the homeowner.

Isn't that the same thing?

No, because the sample pool is different. In the first case, we're looking at all home robberies committed. In the second case we're looking only at the ones that were solved, a much smaller number. Here it is visually:

**All home robberies in a neighborhood:**

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# Enemy of Critical Thinking: Bias!

WISE INSIGHTS
WiseInsights.net

# 50 HIDDEN INFLUENCES THAT CAN WRECK YOUR DECISIONS

## Your Decisions Are Based On "The Facts" Right?

Wrong. Like a raft being pulled by hidden currents, there are over 100 different influences that pull you off course in your decision making.

Here are 50 you need to know about.

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# Enemy of Critical Thinking: Bias!

## 20 COGNITIVE BIASES THAT SCREW UP YOUR DECISIONS

**1. Anchoring bias.**

People are **over-reliant** on the first piece of information they hear. In a salary negotiation, whoever makes the first offer establishes a range of reasonable possibilities in each person's mind.

**2. Availability heuristic.**

People **overestimate the importance** of information that is available to them. A person might argue that smoking is not unhealthy because they know someone who lived to 100 and smoked three packs a day.

**3. Bandwagon effect.**

The probability of one person adopting a belief increases based on the number of people who hold that belief. This is a powerful form of **groupthink** and is reason why meetings are often unproductive.

**4. Blind-spot bias.**

**Failing to recognize** your own cognitive biases is a bias in itself. People notice cognitive and motivational biases much more in others than in themselves.

**5. Choice-supportive bias.**

When you choose something, you tend to feel positive about it, even if that **choice has flaws**. Like how you think your dog is awesome — even if it bites people every once in a while.

**6. Clustering illusion.**

This is the tendency to **see patterns in random events**. It is key to various gambling fallacies, like the idea that red is more or less likely to turn up on a roulette table after a string of reds.

**7. Confirmation bias.**

We tend to listen only to information that confirms our **preconceptions** — one of the many reasons it's so hard to have an intelligent conversation about climate change.

**8. Conservatism bias.**

Where people favor prior evidence over new evidence or information that has emerged. People were **slow to accept** that the Earth was round because they maintained their earlier understanding that the planet was flat.

**9. Information bias.**

The tendency to **seek information when it does not affect action**. More information is not always better. With less information, people can often make more accurate predictions.

**10. Ostrich effect.**

The decision to **ignore dangerous or negative information** by "burying" one's head in the sand, like an ostrich. Research suggests that investors check the value of their holdings significantly less often during bad markets.

**11. Outcome bias.**

Judging a decision based on the **outcome** — rather than how exactly the decision was made in the moment. Just because you won a lot in Vegas doesn't mean gambling your money was a smart decision.

**12. Overconfidence.**

Some of us are **too confident about our abilities**, and this causes us to take greater risks in our daily lives. Experts are more prone to this bias than laypeople, since they are more convinced that they are right.

**13. Placebo effect.**

When **simply believing** that something will have a certain effect on you causes it to have that effect. In medicine, people given fake pills often experience the same physiological effects as people given the real thing.

**14. Pro-innovation bias.**

When a proponent of an innovation tends to **overvalue its usefulness** and undervalue its limitations. Sound familiar, Silicon Valley?

**15. Recency.**

The tendency to weigh the **latest information** more heavily than older data. Investors often think the market will always look the way it looks today and make unwise decisions.

**16. Salience.**

Our tendency to focus on the **most easily recognizable features** of a person or concept. When you think about dying, you might worry about being mauled by a lion, as opposed to what is statistically more likely, like dying in a car accident.

**17. Selective perception.**

Allowing our expectations to **influence how we perceive** the world. An experiment involving a football game between students from two universities showed that one team saw the opposing team commit more infractions.

**18. Stereotyping.**

Expecting a group or person to have certain qualities without having real information about the person. It allows us to quickly identify strangers as friends or enemies, but people tend to **overuse and abuse** it.

**19. Survivorship bias.**

An error that comes from focusing only on surviving examples, causing us to **misjudge a situation**. For instance, we might think that being an entrepreneur is easy because we haven't heard of all those who failed.

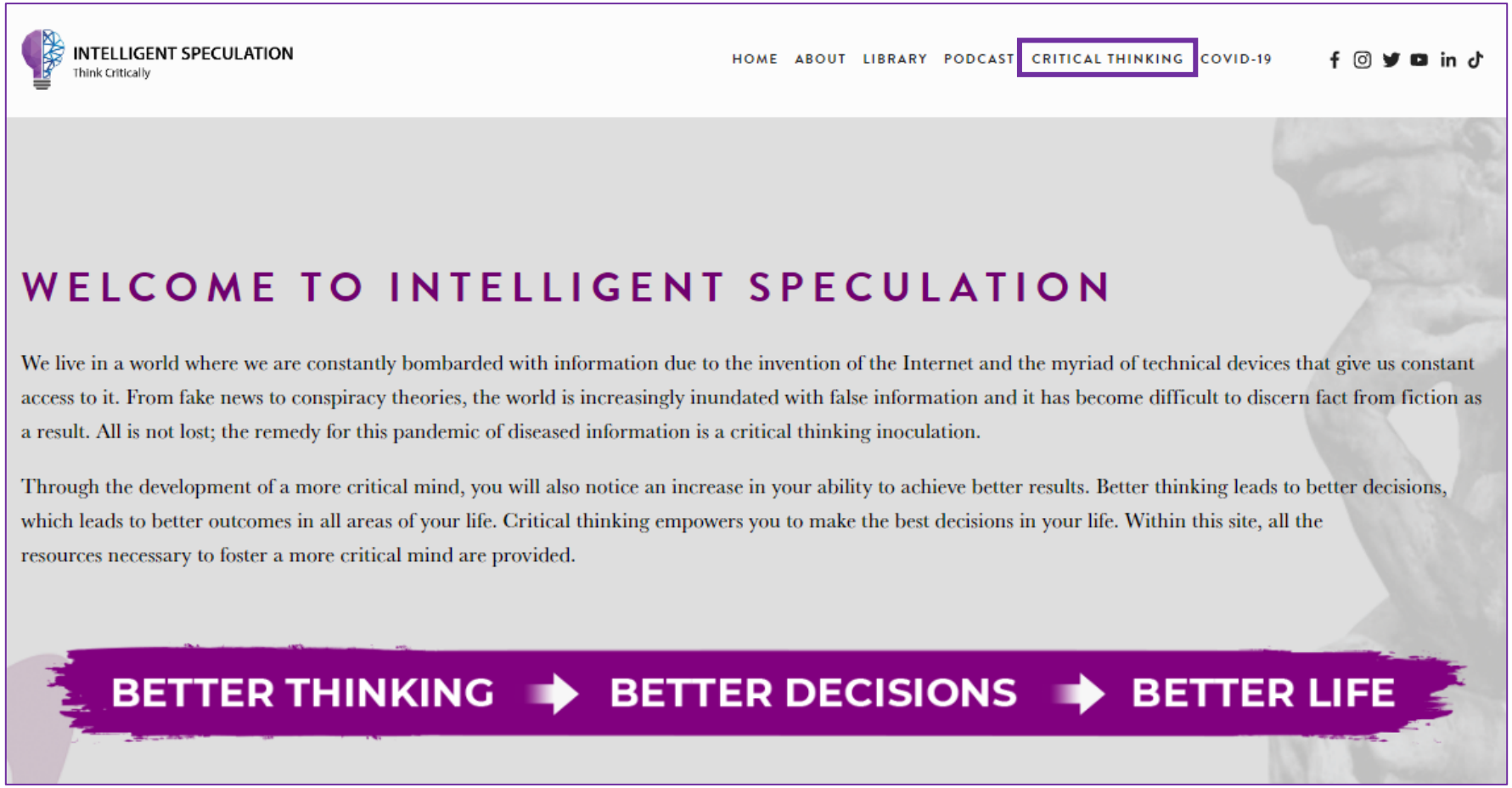
**20. Zero-risk bias.**

Sociologists have found that **we love certainty** — even if it's counterproductive. Eliminating risk entirely means there is no chance of harm being caused.

***SOURCES:*** Brain Biases; Ethics Unwrapped; Explorable; Harvard Magazine; HowStuffWorks; LearnVest; Outcome bias in decision evaluation, Journal of Personality and Social Psychology; Psychology Today; The Bias Blind Spot: Perceptions of Bias in Self Versus Others, Personality and Social Psychology Bulletin; The Cognitive Effects of Mass Communication, Theory and Research in Mass Communications; The less-is-more effect: Predictions and tests, Judgment and Decision Making; The New York Times; The Wall Street Journal; Wikipedia; You Are Not So Smart; ZhurnalyWiki

BUSINESS INSIDER

# Critical Thinking: Resources

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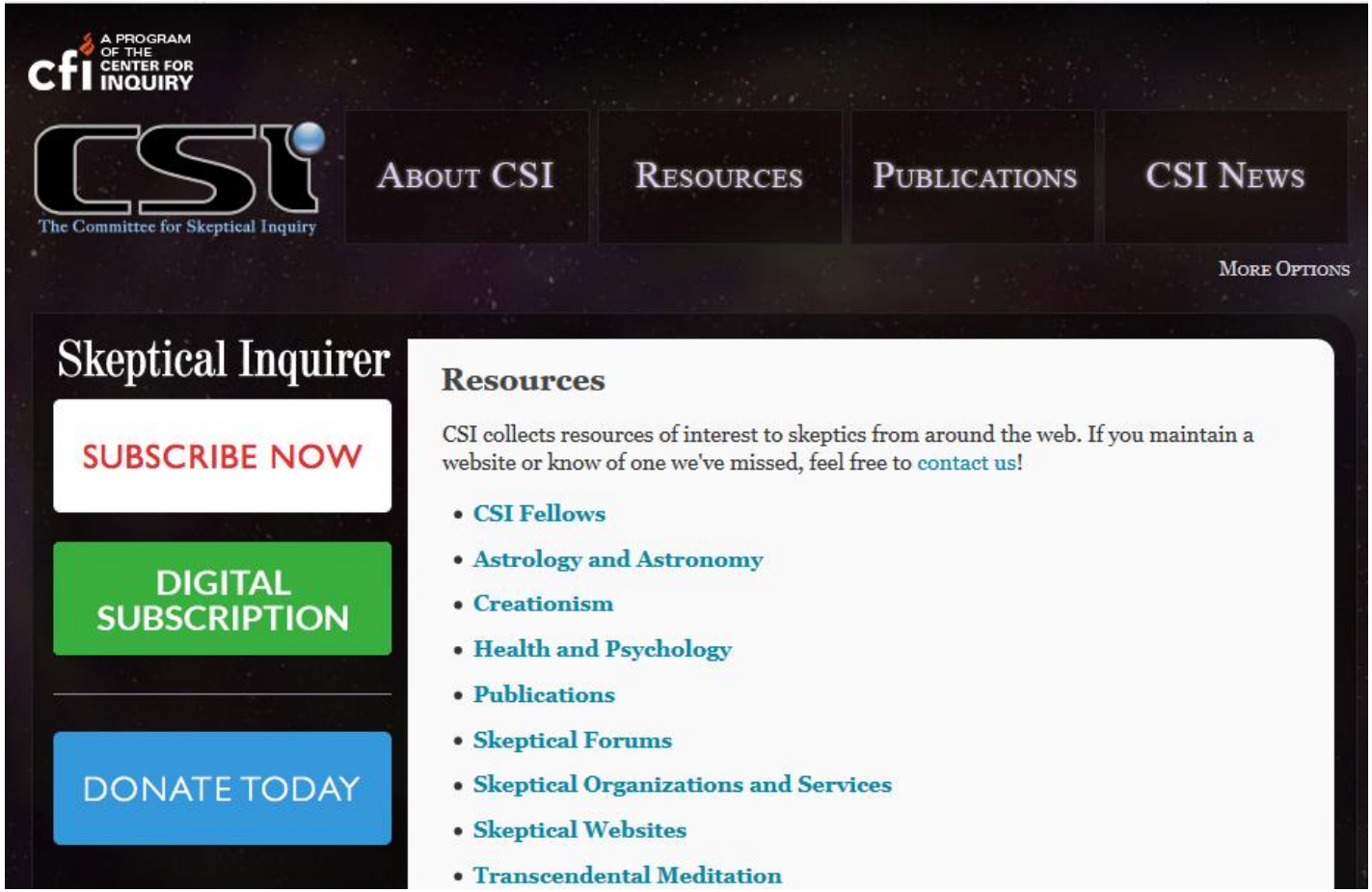

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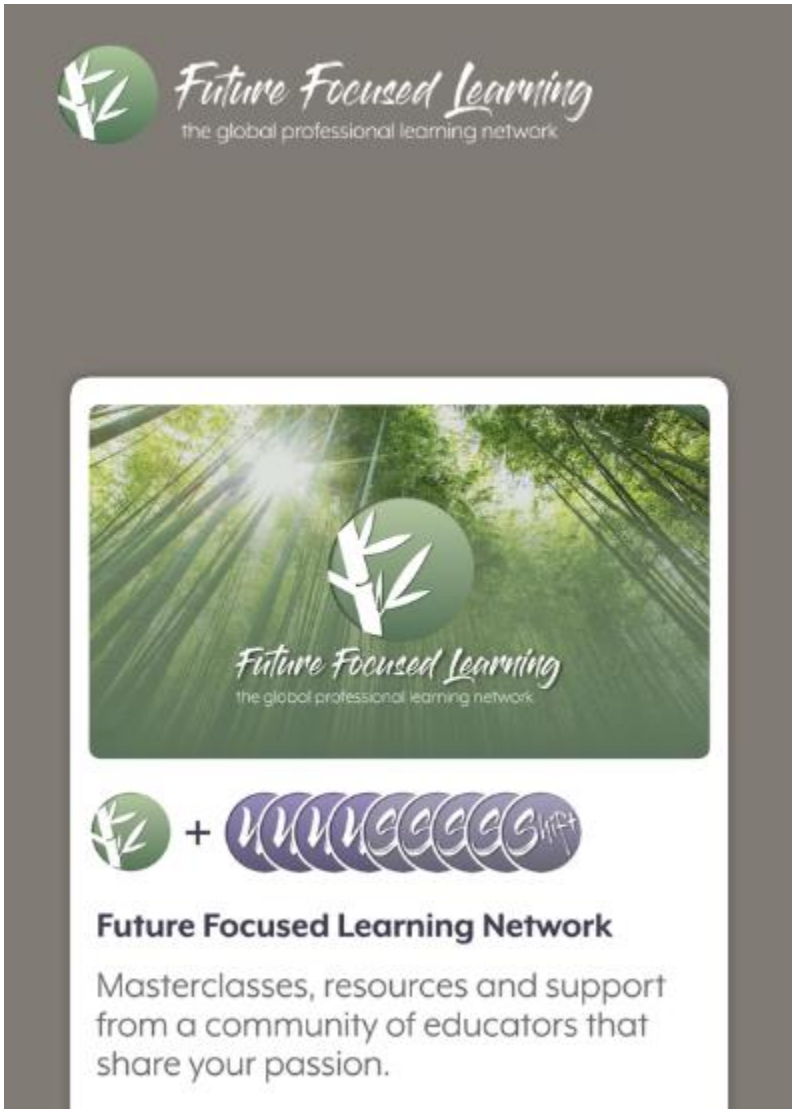


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Future Focused Learning
the global professional learning network

# Critical Thinking: Resources

Learning

388 Results for "critical thinking"


COURSE

**Critical Thinking**

LinkedIn · By: Mike Figliuolo · Updated Oct 2020

4.6 ★★★★☆ (12,478) · 1,033,141 learners


LEARNING PATH

**Critical thinking**

Kingston University · Updated Jan 2020

40 learners · Skill: Critical Thinking

VIDEO

**Critical thinking**

LinkedIn · Updated 2 months ago · From the course: Top 10 Skills for Quantitative Analysts

Skills: Quantitative Analytics, Data Analysis


DOCUMENT

**Critical thinking toolkit**

Kingston University · Jan 2020

79 learners · Skill: Critical Thinking

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# Critical Thinking: Resources

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- NQ Unit search
- Assessment and Exams
- Resources and Support
- NQ Research
- Understanding Standards
- **Skills development**
- Skills for Learning, Life and

## Skills development

Information to promote the skills learners develop alongside their subject-based studies.

See where they can be further developed through our qualifications, Core Skills and our National Courses and Awards. It is important learners develop these skills across the curriculum as they provide learners with the skills they require to be independent and have a successful future.

**What are Skills for Learning, Life and Work?**

**What are Core Skills?**

Select an area below for a selection of qualifications which enhance these skills.



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# Critical Thinking: Resources


Core Skills

A group of five skills key to learning and working in today's world - Communication, Numeracy, Information and Communication Technology, Problem solving and Working with others.


Numeracy

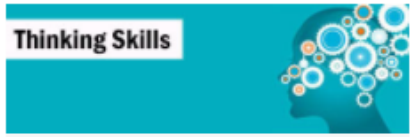
The ability to use numbers in order to solve problems by counting, doing calculations, measuring and understanding graphs and charts.


Health and wellbeing

The ability to take care of yourself and others - including managing your feelings, developing a positive and active attitude to life, and building relationships with others.


Literacy

Literacy is the ability to communicate by reading, by writing and by listening and talking.




Thinking Skills

The ability to develop the cognitive skills of remembering and identifying, understanding, applying, analysing, evaluating, and creating.


Employability, Enterprise and Citizenship

This is the ability to develop skills, understandings and personal attributes - including a positive attitude to work, to others and to the world's resources.

# Critical Thinking: Resources

SQA

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Home > National Qualifications > Skills development > SfLLW > Thinking Skills in National Qualifications - SQA

Subjects

National Qualifications

- NQ home
- Subjects
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- Assessment and Exams
- Resources and Support
- NQ Research
- Understanding Standards
- Skills development
  - **Skills for Learning, Life and Work**
    - Literacy
    - Numeracy
    - Health & Wellbeing
    - Employability, Enterprise and Citizenship
    - **Thinking Skills**
  - Core Skills
- Literacy and Numeracy
- NQ events and CPD

## Thinking Skills

This is the ability to develop the cognitive skills of remembering and identifying, understanding, applying, analysing, evaluating, and creating.

Here are a few suggestions for qualifications that have been identified as focusing directly on these skills.

### National Qualifications supporting Thinking Skills

- Music Technology National 4 SCQF level 4
- Hospitality: Practical Cake Craft National 5 SCQF level 5
- Economics Higher SCQF level 6

### Qualifications supporting Thinking Skills

- Core Skill Problem Solving Unit SCQF level 3 F3GD 09
- Creative Thinking and Goal Setting Unit SCQF level 5 DV91 11

### Thinking Skills case studies

Read Thinking Skills case study (26 KB)

View Exemplification of skills - 'Carnoustie' on Education Scotland website.

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# Critical Thinking: Resources

WOLCOTTLYNCH

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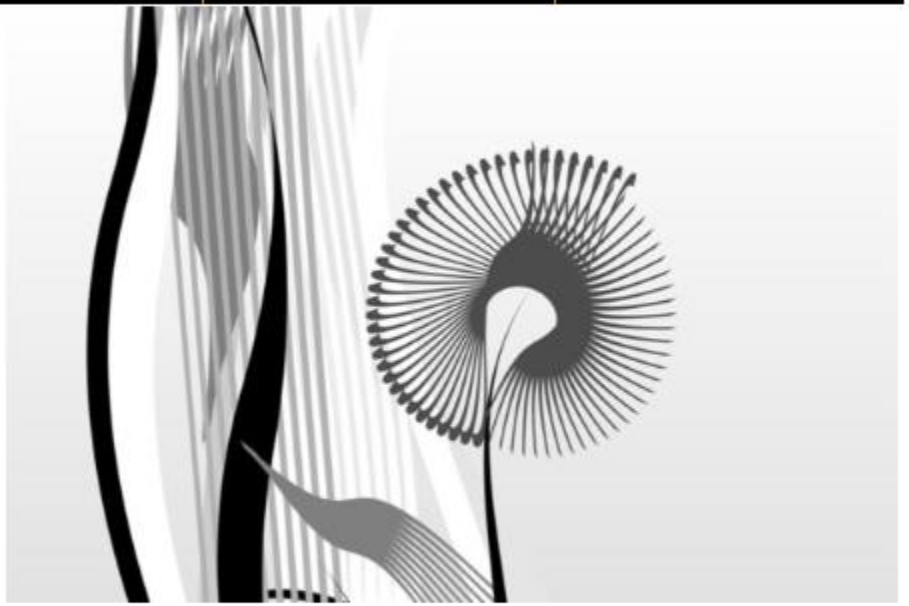
"Steps for Better Thinking"



WolcottLynch conducts research, offers consulting services, and develops innovative and practical educational resources for enhancing and assessing critical thinking, professional problem solving, and other higher-order thinking skills.

ON THIS WEB SITE

Educator resources for using Steps for Better Thinking in teaching, learning and assessment

Tutorial for critical thinking and problem solving

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# Critical Thinking: Resources

Rationale

## Critical Thinking On The Web

A directory of quality online resources



### Top Ten

1. Argument Mapping Tutorials. Six online tutorials in argument mapping, a core requirement for advanced critical thinking.
2. The Skeptic's Dictionary - over 400 definitions and essays.
3. The Fallacy Files by Gary Curtis. Best website on fallacies.
4. Butterflies and Wheels. Excellent reading - news, articles, and much more.
5. Critical Thinking: What It Is and Why It Counts by Peter Facione. Good overview of the nature of critical thinking. (pdf file)
6. Of the Liberty of Thought and Discussion by John Stuart Mill. Classic chapter, densely packed with wisdom about thinking.
7. Chance - best resource for helping students think critically about issues involving probability and statistics
8. Psychology of Intelligence Analysis, by Richards Heuer. A good overview of how to improve thinking in the light of insights from cognitive psychology.
9. A Handbook on Writing Argumentative and Interpretative Essays by Ian Johnston
10. Baloney Detection Part 1 and Part 2 - by Michael Shermer. 10 step guide.

---

### What is critical thinking?

Nobody said it better than Francis Bacon, back in 1605:

*For myself, I found that I was fitted for nothing so well as for the study of Truth; as having a mind nimble and versatile enough to catch the resemblances of things ... and at the same time steady enough to fix and distinguish their subtler differences; as being gifted by nature with desire to seek, patience to doubt, fondness to meditate, slowness to assert, readiness to consider, carefulness to dispose and set in order; and as being a man that neither affects what is new nor admires what is old, and that hates every kind of imposture.*

A shorter version is *the art of being right*.

Or, more prosaically: critical thinking is *the skillful application of a repertoire of validated general techniques for deciding the level of confidence you should have in a proposition in the light of the available evidence.*

More definitions...

---

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# Critical Thinking: Resources

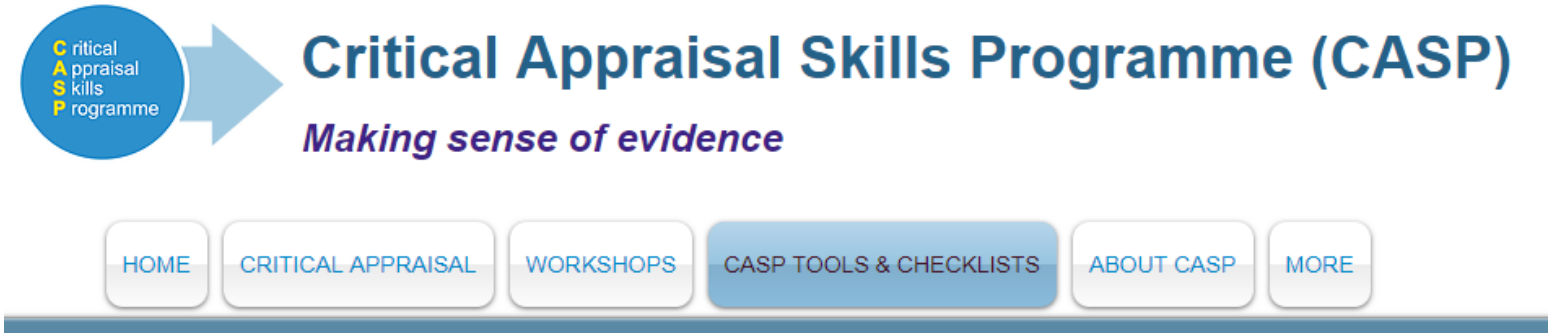
## CASP (Critical Appraisal Skills Programme)

We are introducing you to CASP to help you improve your critical appraisal skills and produce a more evidence based and meaningful journal diary. CASP consists of eight critical appraisal tools (essentially questionnaires) designed to be used when reading research, these include tools for Systematic Reviews, Randomised Controlled Trials, Cohort Studies, Case Control Studies, Economic Evaluations, Diagnostic Studies, Qualitative studies and Clinical Prediction Rule. What is really nice, and really quite powerful about CASP is that you can compare the findings from very different students which is usually very difficult to do in a meaningful way. This link will take you to the eight appraisal tools.

http://www.casp-uk.net/casp-tools-checklists

The supporting pages are also excellent and provide advice on accessing evidence, how to interpret data and examples of studies that have used CASP. All of this is really useful and FREE so you would be really stupid not to use it for your dissertations also.

http://www.casp-uk.net/casp-tools-checklists

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# Critical Thinking: Recommended Books



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# Critical Thinking: Recommended Books

## 10 of the Best Books About Critical Thinking

1. The Critical Thinking Companion—Wabisabi Learning
2. Think Smarter: Critical Thinking to Improve Problem-Solving and Decision-Making Skills—Michael Kallet
3. Wait, What?: And Life's Other Essential Questions—James E. Ryan
4. The Demon-Haunted World: Science as a Candle in the Dark—Carl Sagan
5. A Short Course in Intellectual Self-Defense—Normand Baillargeon
6. How We Know What Isn't So: Fallibility of Human Reason in Everyday Life —Thomas Gilovich
7. Asking the Right Questions—M. Neil Browne & Stuart M. Keeley
8. A Field Guide to Lies: Critical Thinking in the Information Age—Daniel J. Levitin
9. The Unlimited Mind—Zoe McKey
10. How to Think About Weird Things: Critical Thinking for a New Age—Theodore Schick & Lewis Vaughn

CRITICAL, ANALYTICAL & CREATIVE THINKING

**10 of the Best Critical Thinking Books for Boosting Brainpower**

8 MIN READ

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Future Focused Learning
the global professional learning network

# Critical Thinking: Recommended Books

INTELLIGENT SPECULATION
Think Critically

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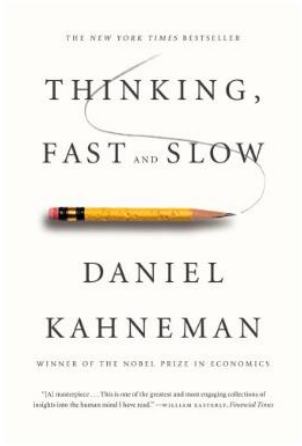
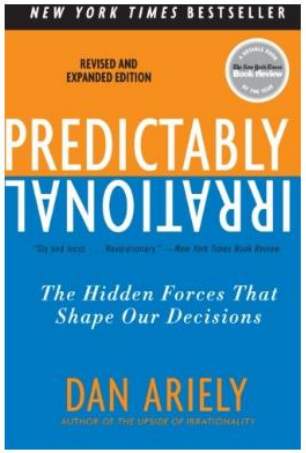
As a Critical Thinker you are also a lifelong learner since intellectual humility demands it. You don't know everything! You must be willing to constantly upgrade your wealth of knowledge and books are a great format for achieving this goal. That said, below are a number of books recommended by us to help you on your journey to critical thinking mastery. Moreover, there are a number of science book recommendations as well as all Critical Thinkers embrace the scientific method and have a deep appreciation for the best framework humans have created to date for being less wrong about the world.

## CRITICAL THINKING




Thinking, Fast and Slow
By Daniel Kahneman

BUY ON AMAZON




Predictably Irrational, Revised and Expanded Edition: The Hidden Forces That Shape Our Decisions
By Dan Ariely

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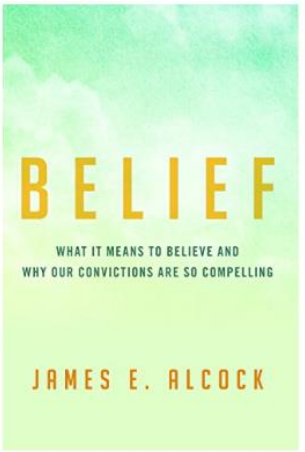
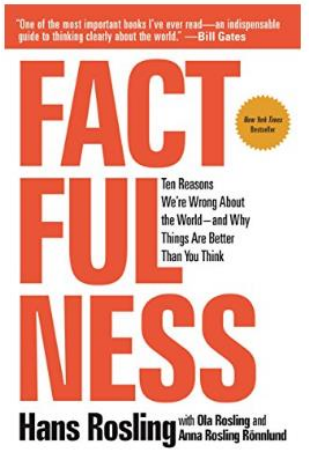


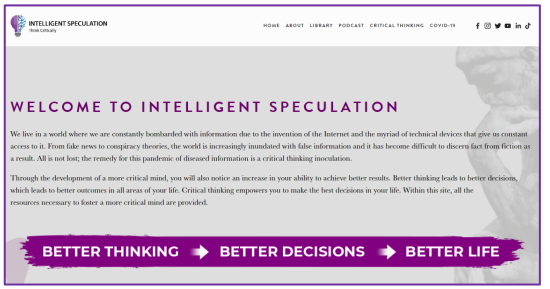

Belief: What It Means to Believe and Why Our Convictions Are So Compelling
By James E. Alcock

BUY ON AMAZON




Factfulness: Ten Reasons We're Wrong About the World--and Why Things Are Better Than You Think
By Hans Rosling, Anna Rosling Rönnlund, Ola Rosling

and more ……..

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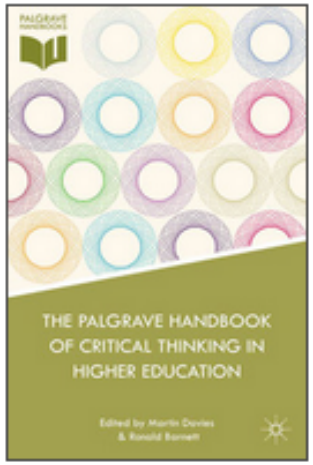
# Critical Thinking: Recommended Books

## The Palgrave Handbook of Critical Thinking in Higher Education

Author: Edited By Martin Davies And Ronald Barnett. Pages: 628 Size: 5.33 MB Format: PDF Publisher: Palgrave
Published: 01 January, 2015
eISBN-13: 9781137378057 Show more




### Description

The Palgrave Handbook of Critical Thinking in Higher Education provides a single compendium on the nature, function, and applications of critical thinking. This book brings together the work of top researchers on critical thinking worldwide, covering questions of definition, pedagogy, curriculum, assessment, research, policy, and application.

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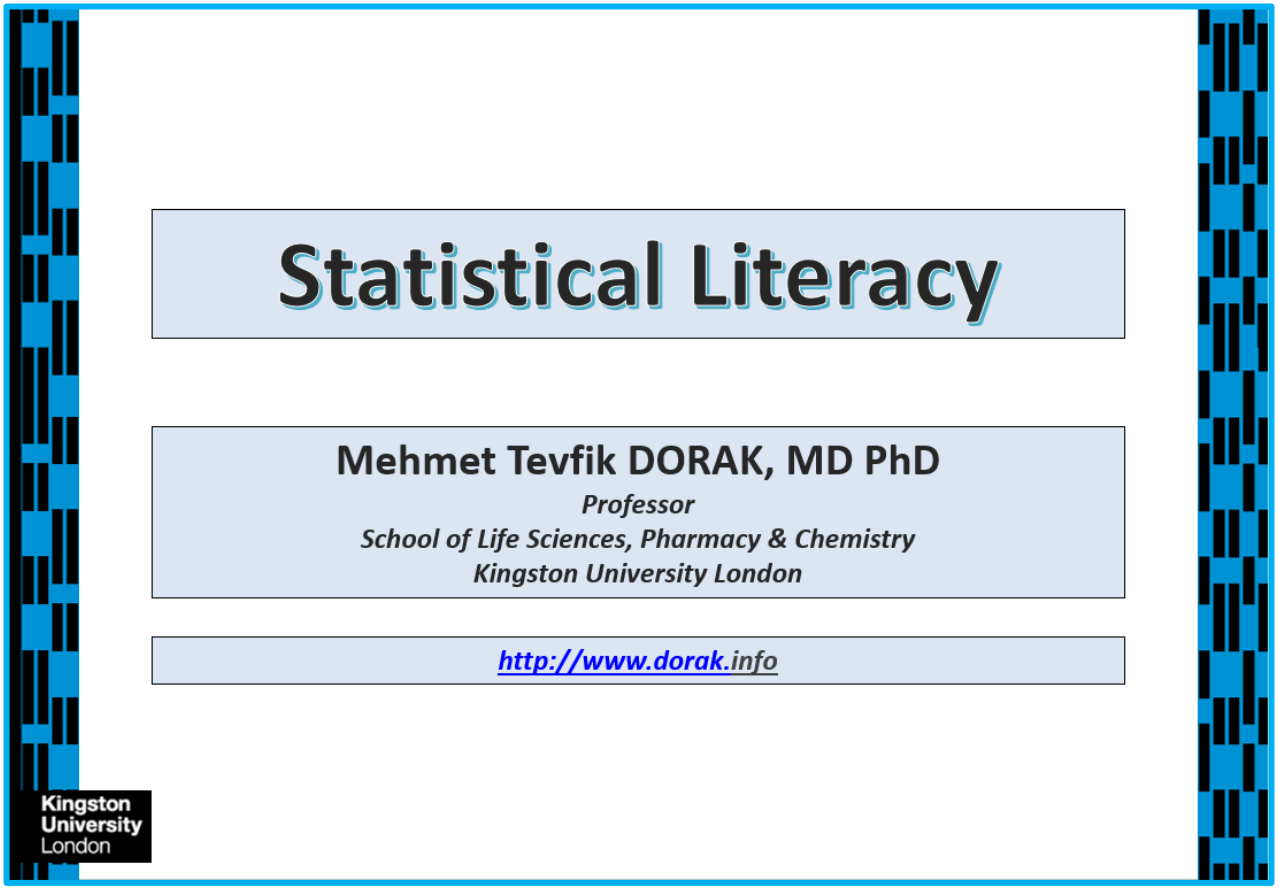
# Statistical Literacy




**BIOSTATISTICS NOTES**

**Mehmet Tevfik DORAK, MD PhD**

Kingston University London

# Welcome to Mehmet Tevfik DORAK's Website

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Biostatistics & Statistical Literacy
Statistics & Graphics with R
Critical Skills  Critical Thinking
Leadership & Equality  Gender Equality
Essentials of Genetics
Genome Biology for Genetic Epidemiologists
Immunogenetics
Evolutionary Biology Notes
Music Notes

**Mehmet Tevfik DORAK, BA (Hons), MD, PhD**

http://www.dorak.info


Good Luck