

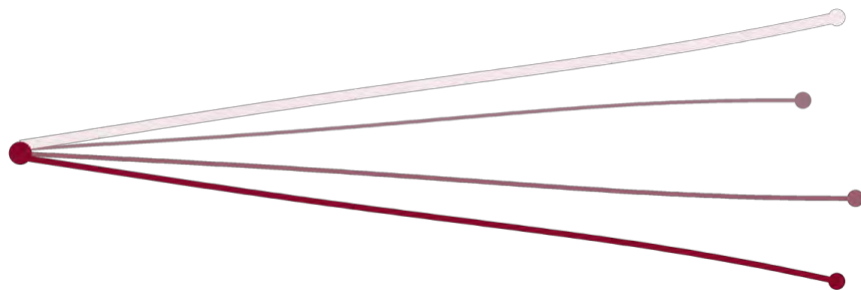
TEACHING GUIDE

Teaching Critical Thinking

Evidence-Based Principles, Pedagogies,
and Classroom Assessment Strategies

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Acknowledgment of AI Use: We used generative AI in two specific ways. First, we consulted Undermind to complement our own individual literature reviews on critical thinking and related topics. Second, we used ChatGPT and Gemini as collaborative drafting and revision tools. Specifically, we iterated with them to clarify ideas, generate cross-disciplinary examples and sample prompts, develop graphics and appendix materials, check the guide's coherence and accessibility, and assist with citation verification and formatting. Most importantly, our work on this guide began and ended with us, and we carefully selected, revised, and verified all AI-generated content. We take responsibility for the guide's final form. –Nancy & Amanda

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What is Critical Thinking?

“There is near-universal agreement about the importance of teaching critical thinking skills for enhancing the quality of our lives. Not only does wise judgement have a positive impact on our professional success, but it also enhances our personal lives, where problem-solving and making informed decisions are equally if not more important. Critical thinking has immense societal benefits as well. An electorate comprised of citizens who have dispositions and attitudes toward critical thinking and who make wise, evidence-informed decisions on public issues ensures the long-term health and wellbeing of our democracy and our planet.”

—Angela Bauer, *Teaching Life Skills in the Liberal Arts and Sciences: Preparing Students for Success Beyond the Classroom*

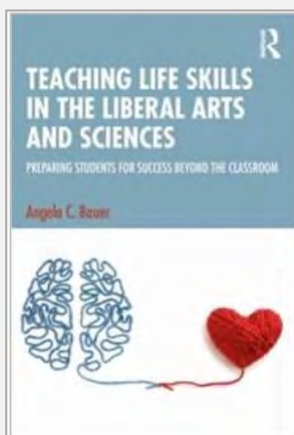
Despite the “universal agreement about the importance of teaching critical thinking skills,” higher education often falls short of helping students develop them (Bauer 2026, 17). The problem isn’t a lack of commitment to critical thinking. It’s partly **a lack of shared understanding about what critical thinking means**—and, as a result, what we should teach, what students should practice, and what evidence would demonstrate their learning.

Critical thinking is an umbrella term for a range of cognitive moves, including evaluation, synthesis, analysis, interpretation, inference, and explanation. These moves take different forms and are judged by different standards across disciplines: thinking critically about a historical source isn’t identical to interpreting a literary text, evaluating a scientific finding, solving a mathematical problem, or making a clinical decision (Bauer 2026, 17; Willingham 2008).

Amid this complexity, **three concise definitions offer clear, broadly applicable ways to understand and explain critical thinking**:

- The AAC&U emphasizes the process leading to a decision, defining it as “the comprehensive exploration of issues, ideas, artifacts, and events before accepting or formulating an opinion or conclusion” (American Association of Colleges and Universities 2009).
- Robert H. Ennis clarifies the purpose of that process, describing critical thinking as “reflective and reasonable thinking that is focused on what to believe or do” (1985, 45).
- Angela Bauer foregrounds the discernment this process requires, describing critical thinking as “making wise judgments” (2026, 17).

These definitions present critical thinking as the deliberate and reflective thought process used to form well-considered beliefs, decisions, and actions.



Angela Bauer’s *Teaching Life Skills in the Liberal Arts and Sciences: Preparing Students for Success Beyond the Classroom* includes a full chapter on teaching critical thinking, which goes into greater depth on the existing research, the varying definitions, and broader institutional assessment opportunities.

Bauer’s chapter has deeply informed this guide, and we encourage readers to engage with the two together.

[You can access and read *Teaching Life Skills in the Liberal Arts and Sciences* online from TWU Libraries.](#)

Critical thinking is contextual, not a single generic skill.

These definitions helpfully identify a shared core of critical thinking, but that thinking takes different forms in different contexts: interpreting a literary text, evaluating a scientific finding, and making a clinical decision require different knowledge, evidence, methods, and standards of judgment.

This dependence on subject matter has an important instructional consequence: students don't learn critical thinking once and then automatically apply it everywhere. **They develop it by engaging with disciplinary content and practices**, and they apply it in new situations when they recognize when and how to adapt their thinking.

A second implication for teaching is the need to make critical thinking explicit. We may expect students to develop it through "immersion" (Ennis 1989, 4) as they encounter difficult content, participate in open-ended activities, and complete challenging assignments. These experiences offer valuable opportunities to practice higher-order thinking skills and perhaps to think critically, but they don't necessarily help students recognize the reasoning a task requires or learn how to carry it out on their own. Pairing critical thinking opportunities with explicit instruction—naming the thinking involved, modeling how it works, and prompting students to examine and practice it—makes that reasoning available for students to learn, use, and adapt anywhere (Perkins and Salomon 1988; Willingham 2020).

Critical thinking involves skills, metacognition, and dispositions.

The need for explicit instruction becomes clearer when we consider the different elements involved in critical thinking:

- skills, or the *ability* to perform particular cognitive moves,
- dispositions, or the *willingness* and *likelihood* to use those moves when they're called for, and
- metacognition, or the *awareness* and *regulation* of one's own thinking.

Although skills make the cognitive moves possible, they aren't enough. Students may be able to use these moves but unwilling to do so. Or they may not recognize when the moves are called for, how well they're working, or when they need to be adapted (Bauer 2026; Halpern 1998; Facione 2023; Driscoll, Gorzelsky, Wells, Hayes, Jones, and Salchak 2017).

Bauer captures this interplay, arguing that "mastery of a particular skill set" alone is insufficient without "the appropriate attitude to recognize when the skills are needed and the willingness to put in the effort to use them" (2026, 23).

Learning to think *critically* means learning to think *differently*.

Learning to think critically can require substantial effort, particularly when students must move beyond familiar approaches. Bauer cautions that students may be "taken aback by the intense, time-consuming cognitive work required to think critically" (2026, 23). The challenge, however, isn't simply the amount of effort involved.

Students may also have to reconsider what learning itself means. Miriam Marty Clark describes the process of "beginning to come to terms with the idea that learning is not only about knowing more but also about thinking differently" (2020, 150). As students learn to question assumptions, work with uncertainty, and adopt unfamiliar disciplinary ways of thinking, they may find the process disorienting.

Because this shift can be disorienting, the new ways of thinking students are learning shouldn't remain implicit. Name and make visible the critical thinking moves embedded in disciplinary work, then give students repeated opportunities to practice them and reflect on when and how they apply. This approach will make unfamiliar expectations more understandable and help students make sense of the changes in their thinking.

The rest of this guide is divided into three sections to help you adopt and adapt these principles in your classes: what to prioritize when teaching critical thinking, how to teach it, and how to assess it.

Four Principles for Teaching Critical Thinking

The four principles below identify what to prioritize as you teach critical thinking, with attention to the ability, awareness, and willingness it requires.

Principles for Teaching Critical Thinking
Make critical thinking explicit.
Integrate critical thinking into disciplinary learning.
Give students repeated opportunities to articulate, test, and revise their reasoning.
Help students recognize and transfer their thinking.

Make critical thinking explicit.

Name the specific critical thinking moves you want students to learn, such as examining assumptions, interpreting evidence, or considering alternative perspectives. (See Appendix A for a menu of possibilities.) Explain why those moves matter and when they're useful, model how experts work through them, and provide prompts that guide students through them in their own work (Abrami, Bernard, Borokhovski, Waddington, Wade, and Persson 2015; van Gelder 2005).



Examples of ways to make the reasoning process visible:

- Explain what a particular critical thinking move helps students accomplish and when it's useful
- Guide students with a sequence of questions for the reasoning process (*What's the claim? What evidence supports it? What assumptions does it rely on? What alternatives should be considered?*)
- Work through an example aloud, demonstrating how an expert analyzes a problem
- Compare situations in which a particular move would and wouldn't be appropriate
- Ask students to map an argument or work through a decision-making framework
- Provide criteria or a rubric describing the qualities of well-supported reasoning
- Use a template prompting students to state, justify, and reconsider a conclusion

Integrate critical thinking into disciplinary learning.

Situate the critical thinking moves you name explicitly within the discipline's questions, evidence, practices, and standards of judgment. As you teach its content, also clarify what counts as relevant evidence, a plausible

interpretation or explanation, and a well-supported conclusion or choice in the field (Abrami, Bernard, Borokhovski, Waddington, Wade, and Persson 2015; Willingham 2019).

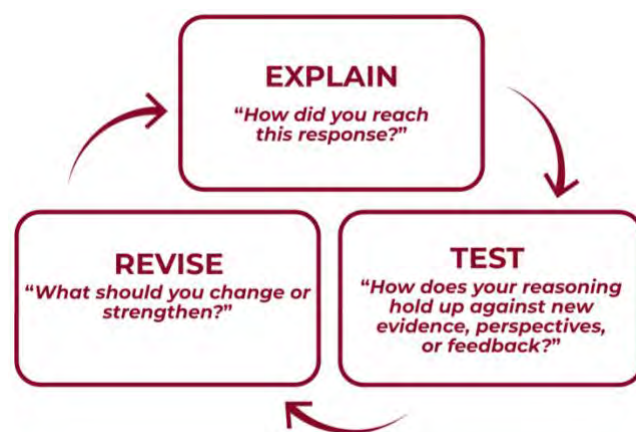


Examples of ways to situate these thinking processes within the discipline:

- Identify the kinds of questions the discipline asks and why those questions matter
- Explain what the discipline considers relevant evidence and how it's evaluated
- Show what analysis, interpretation, evaluation, inference look like within the field
- Make the discipline's methods, conventions, and standards of judgment explicit
- Compare stronger and weaker conclusions, interpretations, explanations, or choices
- Point out how standards of evidence and judgment may differ across fields and contexts

Give students repeated opportunities to articulate, test, and revise their reasoning.

Ask students to explain how they reached a conclusion, interpretation, or choice, not just present their final answer or product. Then prompt them to test that reasoning against new evidence, perspectives, or feedback. Based on what this reconsideration reveals, have them strengthen or change their thinking as warranted (Abrami, Bernard, Borokhovski, Waddington, Wade, and Persson 2015; van Gelder 2005).



Examples of ways to create cycles of practice, feedback, and revision:

- Use brief, low-stakes tasks before asking students to complete more complex work
- Ask students to explain the evidence, assumptions, or criteria behind a conclusion, interpretation, or choice
- Introduce new evidence, counterexamples, constraints, or perspectives that complicate an initial response
- Structure discussions or peer responses around examining reasoning rather than simply expressing agreement or disagreement
- Provide feedback on how students reached their conclusions, not only on the conclusions themselves
- Ask students to revise a conclusion, interpretation, explanation, or choice and explain what changed and why

Help students recognize and transfer their thinking.

Use metacognitive reflection to help students identify which critical thinking moves they've used, why those moves fit a specific task, and how well they worked. This exercise helps students turn experience with one task into knowledge about when and why a form of thinking is useful and relevant. Follow up by giving students opportunities to apply the same moves in new situations and adapt them to different demands (Halpern 1998; Medina, Castleberry, and Persky 2017; van Gelder 2005).



Examples of ways to connect reflection with transfer:

- Use brief reflection prompts after a task: *How did you approach the task? What about the task led you to use that approach? What would you keep or change next time?*
- Use consistent language to name recurring thinking processes across assignments
- Pair tasks that look different but rely on the same underlying forms of thinking
- Ask students to distinguish between situations in which a strategy would and wouldn't apply
- Revisit the same thinking processes with new texts, evidence, problems, audiences, or contexts
- Ask students to explain how and why they adapted their approach in a new situation

These four principles address the complementary conditions students need to learn to think critically:

- **Explicit instruction** makes unfamiliar expectations visible and understandable.
- **Disciplinary integration** gives critical thinking moves meaning and context.
- **Repeated practice and revision** allow students to test and improve their reasoning.
- **Metacognitive reflection** helps students recognize, evaluate, and adapt their thinking.

Evidence-Based Pedagogies for Teaching Critical Thinking

The strategies in this section draw on research about how students learn to think critically and offer adaptable ways to put the principles above into classroom practice.

Explicit Instruction

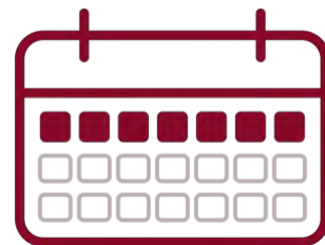
Explicit instruction helps students understand not only what “wise judgment” looks like within a discipline, but also how and why it works (Bauer 2026, 17). By naming and demonstrating particular critical thinking moves and guiding students in using them, you help students recognize when those moves are relevant and adapt them in new situations (Andreucci-Annunziata, Riedemann, Cortés, Mellado, Teresa del Río, and Vega-Muñoz 2023).

Introducing Critical Thinking Early in the Course

Early in the semester, introduce critical thinking through a brief unit connected to the course's disciplinary content (Bauer 2026, 22). This gives students shared language for recognizing the thinking the course will

require and a framework for considering when, why, and how to use it. This introduction to critical thinking in your discipline might consist of

- a clear definition of what critical thinking means in the course and discipline,
- shared language for naming the specific critical thinking moves students will use (See Appendix A for some possibilities.),
- disciplinary examples showing how those moves work and when they're useful,
- a brief activity in which students compare an initial response with one they reach after examining evidence, assumptions, or alternatives
- discussion of why these forms of thinking matter within the discipline and in students' civic, professional, or personal lives (Bauer 2026, 23)



See Appendix B for a sample introductory unit on teaching critical thinking.

After this introductory unit, ask students to reflect on what critical thinking will require of them in the course. Questions might include

- *How would you now describe critical thinking in this course or discipline?*
- *Which critical thinking moves did you use in this activity?*
- *How did examining the evidence, assumptions, or alternatives [or some other specific critical thinking move] affect your initial response?*
- *When might you need to use similar thinking in this course or elsewhere?*

Modeling

Modeling makes the often-invisible work of critical thinking visible and available for students to examine. One way to model is to think aloud—that is, to narrate your reasoning as you work through a disciplinary question, text, problem, dataset, case, or creative choice. In real time, say what you notice, voice the questions that guide your analysis, explain how you interpret or weigh evidence, consider alternatives, and clarify why you reach (or revise) a particular judgment. Annotated examples can also make this reasoning visible by explaining the decisions made at each stage or comparing a stronger response with a weak one.



Effective modeling also shows that critical thinking isn't always a linear or smooth process. You can pause over uncertainty, identify an assumption, reconsider an initial interpretation, or revise a conclusion when the evidence warrants it.

Examples of ways to model critical thinking:

- Analyze a new text, dataset, image, case, or problem in real time, showing how you identify relevant information, ask questions, and determine what warrants attention
- Annotate an argument, interpretation, explanation, solution, or creative work to show how its claims or choices are supported
- Compare two conclusions or interpretations of the same evidence, and explain why one is better supported, more plausible, or more appropriately qualified
- Examine a response with a reasoning problem (e.g., an unsupported claim, overlooked assumption, unwarranted conclusion), and demonstrate how to diagnose and revise it
- Weigh several possible explanations, interpretations, solutions, or courses of action using disciplinary criteria
- Reconsider an initial judgment after introducing new evidence, a counterexample, an alternative perspective, or a new constraint

- Analyze the same material with a colleague to show how different disciplinary perspectives, assumptions, or standards may shape a judgment

After a modeling activity, ask students to describe the reasoning they observed in your demonstration. Questions might include

- *What did you notice about how I approached the task?*
- *What questions guided my thinking?*
- *What evidence, criteria, or assumptions shaped my judgment?*
- *What alternatives did I consider?*
- *When and why did I revise my thinking?*

Practice Activities

Because larger assignments place many demands on students at once (e.g., content, procedures, organization, communication), shorter activities can bring one or two critical thinking moves into focus. Students can practice these moves deliberately before applying them within more complex work.

Analyzing Disciplinary Sources and Evidence

One form of focused practice asks students to analyze disciplinary sources and evidence. Rather than simply asking them to recall an established answer, follow a familiar procedure, or locate information, you can give them a small, purposeful set of disciplinary materials and a question that requires critical judgment. Choose materials that experts in the field actually use or produce and that provide enough evidence for serious analysis without resolving the question automatically. Sources may differ in perspective, reliability, or implications, giving students something meaningful to compare, connect, or question.



Carefully crafted questions can guide students through the reasoning process without predetermining the answer. Ask students to describe the strengths and limitations of each source, identify how they relate to one another, and explain what conclusion can be drawn from them collectively.

Examples of ways to engage students in analyzing disciplinary sources and evidence:

- Use or adapt a source-based activity in which students analyze a curated set of sources, reach a conclusion, and explain its basis. (See Appendix C for two research-based examples and guidance for adapting them.)
- Ask students to use texts, images, artifacts, or historical accounts to develop and support an interpretation.
- Provide a research study, dataset, or visualization and ask students to distinguish what can reasonably be concluded from what remains uncertain.
- Ask students to compare reports, policies, records, or stakeholder accounts and use them to recommend and justify a professional course of action.
- Have students examine creative works, designs, or performances alongside relevant criteria or contextual sources and explain how the evidence informs their evaluation.

After the analysis, ask students to describe and reflect on the reasoning they used (Braun, Shavelson, Zlatkin-Troitschanskaia, and Borowiec 2020; Lilly, Darr, Schmolesky, Lindley, Ludolph, Schilpzand, Shim, Higgins, Weinstein, Burko, and von Deutsch 2022). Questions might include

- *How did you decide what counted as relevant evidence?*

- *How did you assess the strengths and limitations of the sources?*
- *Where did you feel uncertain or reconsider your response?*
- *What would you carry into another source-analysis task?*

Working Through Authentic Situations

Authentic situations give students practice making “wise judgments” by placing disciplinary knowledge in contexts that require analysis, problem solving, and decision-making (Bauer 2026, 17; Abrami, Bernard, Borokhovski, Waddington, Wade, and Persson 2015). Students may need to determine what information matters, draw on relevant knowledge and evidence, consider unfamiliar perspectives or competing responses, and justify a conclusion, decision, or solution. These demands make authentic situations especially valuable for developing critical thinking (Mahdi, Nassar, and Almuslamani 2020, 298).



An authentic situation doesn’t need to come from an actual event, but it should resemble something meaningful students might encounter within the discipline, a profession, or civic life. Students might analyze an ethical dilemma, respond to a case study, solve a problem through a simulation, or assume roles that require them to make and reconsider decisions as circumstances change. Whatever the format, keep the focus on the students’ reasoning. Use focused questions, discussion, modeling, or feedback to help students identify relevant information, compare possible responses, explain their reasoning, and reconsider it when appropriate.

You can vary how much structure the activity provides. More-structured situations identify the problem, highlight important information, offer possible responses, or supply criteria for evaluating them. As students develop relevant knowledge and experience with the reasoning process, gradually ask them to determine more of these elements themselves. The table below (inspired by Wardle 2012) illustrates this progression.

More-structured situations	Less-structured situations
The central problem is identified	Students identify or clarify the problem
Relevant information is highlighted	Students determine what information matters
Possible responses may be provided	Students generate possible solutions
Criteria are established	Students identify or establish appropriate criteria
The evidence points toward a more determinate answer	Several judgments or decisions may be reasonable
Students apply specified concepts or procedures	Students determine which knowledge or methods to apply
Students explain which response is best supported	Students develop and justify a judgment or decision
<i>Example:</i> A patient presents with a specific set of symptoms and medical history. Nursing students are given the relevant clinical information and a list of possible conditions, then identify the most likely diagnosis and the evidence supporting it.	<i>Example:</i> A patient with multiple health conditions wants to continue treatment for an acute illness at home, but the care team is concerned about whether the patient can safely manage the treatment. Nursing students receive information about the patient’s medical history, current condition, medications, and home circumstances. They must determine which factors matter, whether discharge is advisable, and how to justify that decision.

Effective activities built around authentic situations include

- a meaningful problem, scenario, situation, or event,
- a central question or task requiring particular critical thinking moves,
- relevant context, information, evidence, and data that students must interpret,
- opportunities for students to articulate and compare their reasoning, and
- focused questions, modeling, or feedback to help students examine and improve their reasoning (Mahdi, Nassar, and Almuslamani 2020, 297).

Examples of ways to engage students with authentic situations:

- Math: Present a decision or planning problem that can be addressed mathematically in more than one way. Ask students to determine how to represent the problem, compare possible approaches, and justify a solution or recommendation.
- Biology: Provide competing explanations for an unexpected change in an ecosystem. Ask students to determine which explanation is best supported by the available scientific evidence and what remains uncertain.
- English: Place students in the role of a writer, editor, or communication consultant who must adapt a text for a new audience or purpose. Ask students to evaluate possible choices and justify an approach.
- Political science: Build a case around a policy issue involving multiple stakeholders and competing priorities. Assign students stakeholder roles, introduce new information as the discussion unfolds, and ask them to compare possible courses of action and recommend a response.

After the activity, ask students to describe and reflect on the reasoning they used. Questions might include

- *How did you define the central problem or decision?*
- *How did you decide which information and criteria mattered most?*
- *Which alternative response did you consider most seriously, and why did you reject it?*
- *Did new information or another perspective change your judgment? How?*
- *If an important feature of the situation changed, what part of your reasoning would you need to reconsider?*

Discussion Activities

Classroom discussions offer students practice in articulating, testing, and revising "wise judgment[s]" (Bauer 2026, 17). When facilitated well, discussions prompt students to explain the basis for their responses, examine questions or challenges, consider alternative ideas and perspectives, and clarify or reconsider their thinking—not simply participate by sharing ideas and opinions. Classroom discussions also offer students practice in listening, an important but undervalued aspect of critical thinking. Effective listening means students must understand and respond to others' reasoning, rather than merely wait to present their own (Sullivan 2014).

Using Socratic Discussion

The Socratic method is an approach to classroom discussion based on questioning and dialogue. Rather than seeking easy answers, a Socratic discussion uses repeated questioning to help students examine their assumptions, clarify their understanding, consider multiple perspectives, and reason more carefully about the topic at hand (Bauer 2026, 17; Matthiessen 2011). Begin by identifying an overarching question that requires critical judgment. Then develop possible follow-up questions that ask students to examine the evidence, assumptions, perspectives, and reasoning behind their responses. These questions might build toward the overarching question or return to it after students have considered it more fully (Bauer 2026, 27-30).

As you develop questions for Socratic discussion or respond to students on the spot, consider the following types of questions (adapted from Elder and Paul 1998 and Bauer 2026):

- **Deep questions** invite complexity as students engage beyond the surface of a question, topic, or problem (e.g., *What underlying factors might we be overlooking? What are the implications if we take this idea further?*)
- **Questions of information** invite students to interrogate the validity and quality of the sources of information (e.g., *Where does this information come from? What makes this source credible?*)
- **Questions of point of view** prompt students to consider whether their perspective or worldview on the topic is the only one (e.g., *What assumptions might inform your perspective? Whose perspective have we not yet considered?*)
- **Questions of accuracy** ask students to determine whether a claim is adequately supported or can be verified (e.g., *What evidence supports that claim? How could we verify this information? Are there exceptions or counterexamples that might challenge this statement?*)
- **Questions of precision** ask students to be more detailed in their answers and precise in their claims (e.g., *Can you be more specific about what you mean?*)



The following sequence illustrates how Socratic questions can progressively deepen a discussion of biology (excerpted from Elder and Paul 1998, section 4):

- Teacher: This is a course in biology. What kind of a subject is that? What do you know about biology already? Kathleen, what do you know about it?
- Kathleen: It's a science.
- Teacher: And what's a science?
- Kathleen: A science is very exact. They do experiments and measure things and test things.
- Teacher: Right, and what other sciences are there besides biology? Marisa, could you name some?
- Marisa: Sure, there's chemistry and physics.... but don't we all test things? We test our parents and our friends. We try out ideas to see if they work.
- Jose: That's true. But is there any difference between the way you and I test our friends and the way a chemist might test a solution to see if it is acidic?
- Marisa: Sure, but I'm not sure how to explain it.
- Teacher: Blake, what do you think?
- Blake: Scientists have laboratories. We don't.
- Teacher: They also do precise measurements and use precise instruments, don't they? Why don't we do that with our friends, parents, and children? Adrian, do you have an idea why not?

Examples to guide adaptation of Socratic discussions across disciplines:

- **Math:** Ask students to examine the assumptions and reasoning behind different approaches to a mathematical problem.
- **Biology:** Use questions to probe competing explanations and evidence for an unexpected biological phenomenon.
- **English:** Center a discussion on competing interpretations of a literary or rhetorical text, asking students to examine the evidence and assumptions underlying each.
- **Arts and design:** Ask students to examine how particular creative choices shape a work's meaning or effect and what effects alternative choices might have produced.

- Professional fields: Use a disciplinary case or decision to question which information matters, what criteria should guide a response, and which alternatives should be considered.

After a Socratic discussion, ask students to examine how the dialogue affected their thinking and reasoning. Questions might include

- *What idea or question most influenced your thinking during the dialogue? Why?*
- *What assumption(s) did you bring to the discussion that you later questioned?*
- *What perspective or idea did you encounter that you hadn't previously considered?*
- *What could you have done differently to strengthen your reasoning or engage more effectively in the discussion?*

Discussing and Weighing Multiple Perspectives

Discussions that compare and weigh multiple perspectives put students' reasoning into conversation. As students explain positions, listen to how others interpret the issue, answer questions, and respond to challenges, they make reasoning visible and open it to examination. The exchange can reveal overlooked evidence, weak assumptions, misunderstood positions, or consequences that an individual student might not have recognized alone. Students can then clarify, qualify, or revise their thinking in response.

Debate draws on some of these same strengths by asking students to articulate a position, support it with reasons and evidence, and respond to counterarguments. However, a conventional two-sided structure can



encourage students to defend one side and treat the goal as winning. By considering three or more plausible positions and emphasizing understanding, comparison, and evaluation, these discussions retain the active testing of ideas while moving beyond either-or thinking. Students consider what each position explains well, where its evidence or assumptions are weak, and how much weight it deserves before reaching or revising their own judgment (Bauer 2026, 17; Sullivan 2014).

To structure a discussion that compares and weighs multiple perspectives:

1. Choose a question, issue, or problem with several plausible positions, interpretations, or responses. Provide the background knowledge and sources students need to understand them.
2. Ask students to prepare to explain each position in a way its proponents would recognize as accurate, including its evidence, assumptions, criteria, or priorities.
3. Structure listening and response into the discussion. Before challenging a position, students might restate it, ask a clarifying question, or identify what they find most convincing about it.
4. Invite participants to question the evidence, assumptions, strengths, and limitations of each position. Encourage students to respond to these questions rather than simply repeat or defend an initial claim.
5. After the exchange, ask students to reach or revise their own judgment and explain why they gave some evidence, considerations, or positions more weight than others.

Examples of ways to engage students in discussing and weighing multiple perspectives:

- Invite groups to develop and support different interpretations of a text, artwork, historical event, or cultural practice, then guide the class in comparing what each interpretation explains or overlooks.
- Assign students several explanations for a scientific finding or observed phenomenon, then ask them to question the evidence behind each and identify what additional evidence would help distinguish among them.

- Structure a policy roundtable in which students represent different stakeholder positions, respond to one another's priorities and concerns, and work toward a reasoned recommendation.
- Organize a professional case conference in which students discuss recommendations based on different needs, criteria, risks, or constraints before deciding how to proceed.

After the discussion, ask students to reflect on how explaining, hearing, and responding to different perspectives affected their reasoning. Questions might include:

- *Which perspective did you understand differently after hearing someone explain it?*
- *What question or response revealed a strength or weakness you hadn't noticed?*
- *How did responding to others' questions affect your own position?*
- *How did you decide which perspectives or evidence deserved more weight?*
- *How and why did your understanding of the topic change as a result of encountering multiple perspectives?*

Metacognitive Activities

You may have noticed that each of the previous pedagogies includes brief questions asking students to examine the reasoning they observed or used. That reflection is intentional. Metacognitive activities help students identify the critical thinking moves involved in their work, evaluate how well they used them, and consider when and how to use or adapt them again. Because practice alone doesn't ensure that students recognize or monitor their reasoning, metacognition can—and perhaps should—accompany every critical thinking activity in this guide (Bensley and Spero 2014; Halpern 1998; Medina, Castleberry, and Persky 2017).

Critical Thinking Logs

Critical thinking logs can take many forms, from recurring one-question entry or exit tickets and brief reflections attached to selected assignments to an ongoing journal maintained across a semester. What makes them “logs” isn't a particular format but the recurring opportunity they give students to record and examine their reasoning. Each entry directs attention away from just the answer or product and toward the process that produced it. Over time, articulating that process can help students monitor the quality of their reasoning, recognize similar thinking in new work, and decide when an approach should be used or adapted.



Keep each log entry focused on the particular reasoning the preceding activity was designed to develop. Select one or two of the reflection questions provided at the end of the relevant subsection, rather than asking students to address every aspect of their thinking at once. You can use those questions as written or adapt them to the particular activity. The value of these entries, which can remain brief and low stakes, comes from students repeatedly naming and examining their reasoning, not from producing lengthy or polished responses.

Examples of ways to incorporate critical thinking logs:

- Add one or two reflection questions to an entry or exit ticket
- Include a brief reasoning reflection with an activity or assignment
- Ask students to identify a place in their work where they felt uncertain, changed direction, or revised a conclusion and explain what prompted it
- Ask students to revisit an initial response after feedback, discussion, or new evidence and explain what changed and why
- Have students maintain an ongoing journal with brief entries connected to select activities throughout the course

Cumulative Critical Thinking Reflections

At the end of a course or unit, ask students to look across several experiences and explain what they've learned about their own reasoning. While individual logs capture thinking connected to a particular activity, a cumulative reflection asks students to identify patterns and changes. Students can identify the critical thinking moves they used (e.g., evaluating evidence, examining assumptions, considering alternative perspectives) and point to places in their work where those moves are visible. They can then compare earlier and later work to describe where they struggled or continue to struggle and examine whether and how their reasoning changed. They can also identify moments when new evidence, feedback, an alternative perspective, or the results of their own approach led them to revise their thinking.

Make sure students ground this reflection in evidence rather than making general claims about their growth. Have them draw on critical thinking logs, drafts, feedback, revisions, discussion notes, or completed assignments to illustrate what they've learned about their own thinking. The goal isn't to produce a simple story of improvement: students should also identify persistent uncertainties, approaches that didn't work, or kinds of reasoning they still need to develop. Examining specific evidence across the course can help them understand their critical thinking as a process they can continue to monitor, adapt, and strengthen (Medina, Castleberry, and Persky 2017; Yancey 1998).



Example prompts for a cumulative critical thinking reflection:

- *Review several pieces of work from this course. Which critical thinking moves appear repeatedly? Point to specific examples.*
- *Compare how you used the same critical thinking move in an earlier and later task. What did you do differently, and why?*
- *Across your work, what most often led you to question, qualify, or revise your initial thinking?*
- *What patterns do you notice in the strengths and limitations of your reasoning?*

Assessing Critical Thinking

Assessing critical thinking means examining the quality of the reasoning evident in students' work. Assessment can help students strengthen their reasoning as a course unfolds and evaluate what they can do by the end.

Because critical thinking takes different forms across disciplines and tasks, assessment should focus on the particular moves you asked students to learn and practice. A single performance can show how a student reasoned in one context, while evidence from multiple opportunities can reveal development over time.



1. Identify the thinking moves to assess. Choose the particular critical thinking moves the task is intended to elicit (see Appendix A). A focused set makes it easier to define what effective use looks like, evaluate each move, and provide specific feedback.

2. Elicit evidence of students' thinking. Evidence of critical thinking may be visible in the final essay, presentation, solution, or other product. When the product alone won't clearly reveal the targeted moves, build a focused question, brief annotation, process note, or reflection into the task itself. Ask students to explain only the part of their reasoning needed for assessment rather than complete a separate account of

their entire process. These explanations can also support the metacognitive work described in the preceding section.

3. Evaluate the critical thinking moves with clear criteria. Describe what stronger and weaker use of each targeted move looks like for the particular task and discipline (see Appendix D for sample rubrics). Criteria should distinguish between merely performing a move and using it effectively (e.g., between including evidence and selecting relevant evidence, interpreting it accurately, and explaining how it informs a conclusion). Share the criteria before students begin so they can guide students' work, self-assessment, and your evaluation.

4. Use ongoing assessment to guide students' next steps. During the course, provide feedback on how students reasoned and identify a particular move to strengthen in revision or subsequent work. Revisit targeted moves so students can apply feedback with increasingly complex material and greater independence, making assessment part of a cycle of practice, feedback, and revision.

5. Assess what students can do by the end of the course. Decide whether the final assessment will examine students' culminating performance, their development over time, their ability to adapt their reasoning to a new context, or some combination of these.

- *To assess culminating performance*, use a task that requires students to coordinate the targeted critical thinking moves with greater independence. Evaluate it using the same criteria students encountered earlier in the course.
- *To assess development*, compare a small selection of earlier and later work (or an initial response and its revision) using consistent criteria. Look for changes in the quality, independence, or adaptability of students' reasoning.
- *To assess transfer*, ask students to use familiar critical thinking moves in a new but related task and explain how they adapted their approach to its demands.

A cumulative critical thinking reflection can help students identify evidence of their development and explain changes in their reasoning, but it should complement rather than replace the work being assessed.

See Appendix D for a guided assessment process, established critical thinking rubrics, and an example of adapting criteria to a particular task.

Bringing It All Together

Teaching critical thinking doesn't require adding an entirely new layer to a course. Begin with a question, activity, or assignment students already encounter, and identify the critical thinking moves embedded within it. Name those moves, show students how they work in the discipline, give students focused opportunities to practice and revise them, and then use reflection to help students recognize when and how to apply them again.

Not every activity needs to accomplish all of these goals at once. Across a course, however, the instruction, practice, reflection, and assessment should form a coherent sequence:



- The moves named and modeled should be the ones students practice.
- The moves practiced should be the ones assessed.
- The feedback students receive should inform their next opportunity to reason.

This alignment helps students develop more than the ability to complete a particular task. It helps them understand their own reasoning, recognize when critical thinking is called for, and become increasingly willing and able to use it with purpose in new situations.

Teaching Critical Thinking with AI

A 2026 systematic review found that generative AI (specifically ChatGPT in this study) supported critical thinking most consistently in **guided, iterative activities that required students to question, evaluate, receive feedback on, and revise AI-generated material—activities that map directly onto this guide’s recommendations for teaching critical thinking**. Unguided use, on the other hand, was associated with passive acceptance, cognitive offloading, and weaker critical engagement (Li, Cui, and Hagedorn 2026).

If you want to incorporate AI into your students’ critical thinking activities, or if you want to proactively provide an alternative to students’ unguided use of AI, do the following:

- Define AI’s role in the activity, including what students should use it for, what reasoning they should do themselves, and how they should evaluate its output.
- Position its output as something students should question and evaluate, not an answer to accept.
- Ask students to assess its claims, assumptions, and reasoning using disciplinary criteria.
- Require students to verify relevant claims and explain what they accepted, rejected, or revised.
- Use cycles in which students generate possible explanations, interpretations, solutions, or approaches and then critique AI’s response, incorporate feedback from you and peers, and revise their own work.
- Follow the activity with reflection, such as *How did the AI output shape your thinking? What was useful or misleading? What did you change, and why?*

These practices reflect the review’s recommendations to align AI use with a task’s goals, teach AI literacy explicitly, have students use a cycle of question-evaluate-revise AI-assisted work, and combine AI feedback with peer response, instructor input, and self-assessment (Li, Cui, and Hagedorn 2026, 11–12).

You can also have your students use Gemini’s “Guided Learning” mode, which acts as a Socratic tutor: rather than providing answers or simple praise, it counters input with scaffolded questions and asks the user to explain assumptions, provide evidence, or consider alternative viewpoints (Ernst 2026). Simply click the “+” to the left of the “Ask Gemini” prompt, and select Guided Learning.

AI can also support you in designing critical thinking activities. Chapter 2 of Bauer’s *Teaching Life Skills in the Liberal Arts and Sciences* provides ready-to-use prompts for using AI to develop argument-analysis, problem-solving, and transfer activities, generate Socratic questions and a discussion rubric, and create case studies (Bauer 2026, chap. 2).

Appendix A: Identifying Critical Thinking Moves in Your Discipline

Critical thinking isn’t a single, generic skill. It involves different observable thinking moves whose meaning and use vary by discipline. This appendix is a menu (not a checklist) to help you identify the critical thinking moves already embedded in your discipline and find language for naming them more explicitly.

Scan the four sections below and begin with whichever sounds most familiar to the work of your discipline. Then browse the detailed lists for words or phrases that describe what the specific moves look like. Select, combine, or adapt the language that fits.

Section	Includes moves related to
Ask and examine	Framing an inquiry, examining information and evidence, and analyzing

Section	Includes moves related to
	texts, data, objects, or events
Interpret and question	Interpreting meaning and significance, uncovering assumptions, and considering perspectives
Generate and judge	Developing possibilities, evaluating claims or choices, synthesizing evidence, and reaching a judgment
Apply and reconsider	Applying disciplinary knowledge, communicating reasoning, testing ideas, revising, and reflecting

How these moves appear across disciplines

These sections don't correspond to particular disciplines. Each discipline draws on moves from across the four sections, although it may describe and combine them differently. The examples below illustrate some possibilities. Look across the table for descriptions that resemble the work of your discipline, then use the detailed menu that follows to identify or adapt more precise language.

Field	Critical thinking may involve
Arts and design	Generating alternatives, making purposeful choices, applying criteria, and revising through critique
Humanities	Interpreting texts or artifacts, examining assumptions, comparing readings, and supporting an interpretation
History	Contextualizing sources, corroborating accounts, identifying perspective, and weighing evidence
Mathematics	Defining conditions, selecting strategies, testing conjectures, and justifying conclusions
Sciences	Formulating hypotheses, evaluating methods, interpreting data, and judging uncertainty
Social sciences	Operationalizing concepts, evaluating measures, comparing explanations, and considering context
Engineering	Defining constraints, comparing designs, assessing tradeoffs, and testing solutions
Health professions	Interpreting evidence, considering alternative explanations, assessing risk, and revising decisions
Business	Analyzing information, comparing options, evaluating risk, and deciding under uncertainty

Detailed Menu of Critical Thinking Moves

This menu synthesizes and adapts descriptions of critical thinking and disciplinary reasoning from the AAC&U Critical Thinking VALUE Rubric, the Delphi Report, NACE's career-readiness competencies, TWU's critical thinking assessment materials, and disciplinary frameworks in mathematics, science, and history (Association of American Colleges and Universities 2009; Facione 1990; National Association of Colleges and Employers 2024; National Council of Teachers of Mathematics 2000; National Research Council 2012; Texas Woman's University 2021; Wineburg 1991).

Ask and examine

Frame the inquiry

- Identify a significant question, problem, issue, or creative challenge
- Define key terms and establish the inquiry's scope
- Break a complex question or problem into manageable parts
- Identify what evidence would be needed and what would count as an adequate answer
- Formulate a research question, hypothesis, problem statement, or design brief
- Notice ambiguity or an important question that hasn't been asked

Examine information, evidence, and sources

- Locate evidence or source material relevant to the question
- Evaluate a source's credibility, purpose, perspective, audience, and context
- Distinguish claims, evidence, assumptions, observations, and interpretations
- Corroborate information and identify gaps, inconsistencies, or uncertainties
- Assess whether the method used to produce the evidence fits the question
- Recognize limitations in sampling, measurement, design, or interpretation
- Seek disconfirming as well as supporting evidence
- Determine how confident a conclusion can reasonably be given the evidence

Analyze texts, data, objects, and events

- Identify significant elements, features, variables, or components
- Examine how parts relate to one another and to the whole
- Recognize patterns, themes, structures, relationships, anomalies, or outliers
- Compare cases, accounts, interpretations, or representations
- Trace processes, developments, or changes over time
- Distinguish correlation from causation and examine interacting causes
- Interpret quantitative, qualitative, visual, spatial, symbolic, or embodied evidence
- Analyze whether an argument's conclusion follows from its reasons and evidence

Interpret and question

Interpret meaning and significance

- Develop and support a plausible interpretation of a text, image, object, performance, event, or finding
- Consider how historical, cultural, social, or disciplinary contexts shape meaning
- Examine how language, form, medium, or technique contributes to meaning
- Distinguish what's stated explicitly from what's implied
- Evaluate the significance of a pattern, event, choice, or finding
- Consider multiple plausible interpretations

Examine assumptions and perspectives

- Identify stated and unstated assumptions, including biases that may shape an interpretation or judgment
- Consider how assumptions shape a question, method, argument, or conclusion
- Identify which perspectives are represented, emphasized, or absent
- Consider alternative explanations, interpretations, or points of view
- Represent competing positions fairly and account for complexity

- Identify the conditions under which a claim or interpretation might not hold

Generate and judge

Generate explanations, interpretations, and possibilities

- Develop a hypothesis, causal explanation, or interpretive account
- Generate multiple interpretations, solutions, or strategies
- Develop a model, analogy, scenario, or representation
- Make a prediction and explain its basis
- Imagine alternatives or generate a counterexample or counterfactual
- Make purposeful creative or design choices

Evaluate claims, interpretations, and choices

- Apply appropriate disciplinary criteria or standards
- Determine whether a claim or interpretation is adequately supported
- Test an explanation or interpretation against the evidence
- Compare competing claims, interpretations, solutions, or designs
- Evaluate feasibility, anticipate consequences, and prioritize possible actions
- Weigh ethical implications, constraints, risks, benefits, and tradeoffs
- Make a reasoned decision under conditions of incomplete information

Synthesize and reach a judgment

- Integrate ideas or evidence from multiple sources
- Connect knowledge, theories, or perspectives across contexts or fields
- Reconcile evidence that points in different directions
- Draw and qualify a conclusion supported by the evidence
- Develop a position that accounts for complexity

Apply and reconsider

Apply disciplinary knowledge and methods

- Use disciplinary concepts or theories to examine a new case
- Select and apply a method appropriate to the question or problem
- Use mathematical, computational, experimental, interpretive, historical, creative, clinical, or design-based reasoning
- Apply knowledge to a practical, professional, or social problem
- Adapt disciplinary knowledge for a different audience or purpose
- Implement and justify a solution, strategy, design, product, performance, or representation

Communicate reasoning

- State a claim, interpretation, or position clearly
- Organize ideas and evidence logically
- Explain the reasoning behind a conclusion, action, or choice
- Make qualifications, limitations, and uncertainty clear
- Anticipate and respond to questions or objections
- Recognize relevant audiences, stakeholders, and perspectives
- Make thinking visible in writing, speech, models, performances, or other forms

Test, revise, and reflect

- Test an idea against additional evidence, examples, or cases
- Use questions, critique, or feedback to examine the reasoning
- Revise a claim, interpretation, solution, or product and explain why
- Evaluate the outcome and the strengths and limitations of the process
- Determine when a reasoning strategy would—or wouldn't—apply
- Monitor understanding, uncertainty, and the quality of the reasoning
- Learn from unsuccessful approaches

Appendix B: Sample Early Unit on Teaching Critical Thinking

The sample activities below introduce critical thinking early in the semester through material connected to the course. It provides a starting point that should be reinforced as students encounter more complex disciplinary work (Bauer 2026, 22–23).

Guiding question	Activity
<i>What is critical thinking?</i>	Ask students to describe what they think critical thinking means, then compare responses. Provide a clear definition for the course and discipline.
<i>What does critical thinking look like in this course?</i>	Name two or three critical thinking moves students will use (see Appendix A), and illustrate them with a brief disciplinary example. Explain what each move helps accomplish and when it's useful.
<i>How does critical thinking shape a response?</i>	Present a brief disciplinary example and model how an initial interpretation, conclusion, or choice changes—or becomes more carefully qualified—after examining relevant evidence, assumptions, or alternatives. Ask students to identify what changed and why, then guide them through a similar example.
<i>Why does this thinking matter?</i>	Connect these moves to the work of the course and to their broader disciplinary, professional, civic, or personal value.
<i>What and how did you learn?</i>	Conclude with a brief reflection: <i>What did these thinking processes help you notice or reconsider? When might you use a similar process in your future outside of this course (e.g., your job, family life, work with the community)?</i>

Follow-up Activity (Day Two or Homework): Choose a brief, course-relevant task that requires students to use one or two of the critical thinking moves modeled on the day above. For example, ask them to interpret a short passage or image, evaluate a claim using a small set of evidence, compare two explanations, or choose among possible responses to a case. Provide enough context for students to reason from the material rather than guess, and use focused questions to guide them:

- *What conclusion, interpretation, or choice did you reach?*
- *Which critical thinking moves did you use?*
- *What evidence, assumptions, or alternatives influenced your reasoning?*
- *How did those moves help you develop or reconsider your response?*
- *When might you use or adapt the same moves again?*

Appendix C: Models for Source and Evidence Analysis Activities

History Assessments of Thinking (HATs) and International Performance Assessment of Learning (iPAL) tasks offer two research-based models for engaging students in critical analysis of curated sources: HATs are brief, focused tasks designed to elicit a particular disciplinary thinking move, while iPALs ask students to coordinate several moves as they analyze a larger collection of materials. Although developed as assessments, both can be adapted for formative practice.

History Assessments of Thinking (HATs): Developed by the Digital Inquiry Group, HATs ask students to answer a focused question about one or more historical sources and briefly explain their reasoning. Each task targets a particular historical thinking competency, such as sourcing, contextualization, corroboration, or use of evidence (Smith, Breakstone, and Wineburg 2019).

For example, [The First Thanksgiving](#) focuses on one aspect of sourcing: how the time between an event and the creation of a document affects its usefulness as evidence about the past. Students consider when each document was produced and how that information should shape its

interpretation. The accompanying lessons offer ways to teach the skill, use the task formatively, and track students' progress over time.

International Performance Assessment of Learning (iPALs): iPAL tasks place students in a realistic scenario that requires them to address a complex problem using a curated portfolio of documents (Braun, Shavelson, Zlatkin-Troitschanskaia, and Borowiec 2020). Students evaluate and connect information from multiple sources, develop a conclusion or recommendation, and explain the reasoning behind their response.

In one iPAL task, students advise a fictional country responding to an influx of refugees. They examine varied materials (e.g., demographic and crime data, news coverage, government reports, an expert interview, human-rights documents) to develop a recommendation. They must also explain the limitations of the available information and identify what else they'd need to know.

Adapting the Models

Begin with the critical thinking move or combination of moves students need to practice. Use a HAT-style activity to isolate one move in a brief source-based task, or an iPAL-style activity to have students coordinate several moves across a larger portfolio of materials. In either case, provide the necessary disciplinary context and source materials, ask a question that requires judgment rather than recall, and align the feedback or assessment with the reasoning the task was designed to elicit.

Appendix D: Examples and Models for Assessing Critical Thinking

Critical thinking can't be assessed with the same criteria in every discipline or task. The resources below illustrate how broad critical thinking processes can be translated into observable criteria and descriptions of different levels of performance. Use them as models for selecting and adapting criteria that fit the particular moves you've asked students to demonstrate and for describing what stronger and weaker use of those moves looks like in the task and discipline.

Resource	Criteria and performance descriptions it offers	How to use it
AAC&U Critical Thinking VALUE Rubric * (2009)	Broad criteria with four performance levels across evidence, assumptions, positions, and conclusions; useful across disciplines	Select and adapt the dimensions relevant to the task, using language and performance descriptions appropriate to the discipline
ELIPSS Critical Thinking Rubric (Reynders et al. 2020; see Figure 2 on page 9)	Analytic criteria with descriptions of increasingly effective performance in undergraduate STEM courses	Use as a model for describing observable levels of performance on particular reasoning moves
Cargas, Williams, and Rosenberg Humanities Rubric (2017; see Appendix A on page 35)	Humanities-based criteria with performance descriptions for interpretation, evidence, context, and alternative perspectives	Adapt relevant criteria for work involving texts, artifacts, arguments, historical contexts, or interpretive claims
History Assessments of Thinking Scoring Rubrics * (at the end of individual HATs)	Task-specific criteria within a single discipline with three levels describing students' use of a particular historical thinking move	Use as a model for closely aligning a focused task with the particular disciplinary moves it's intended to elicit

* Requires a free account to access the downloadable rubrics.

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