Teaching students to think critically is high on any teacher’s to-do list. So what strategies are consistent with the research?

- **Special programs aren’t worth it.** In the sidebar on page 12, I’ve mentioned a few of the better known programs. Despite their widespread availability, the evidence that these programs succeed in teaching students to think critically, especially in novel situations, is very limited. The modest boost that such programs may provide should be viewed, as should all claims of educational effectiveness, in light of their opportunity costs. Every hour students spend on the program is an hour they won’t be learning something else.

- **Thinking critically should be taught in the context of subject matter.** The foregoing does not mean that teachers shouldn’t teach students to think critically—it means that critical thinking shouldn’t be taught on its own. Instead, students should spontaneously examine assumptions that underlie their thinking, try to consider all sides of an issue, question what they know, etc. These things must be modeled for students, and students must be given opportunities to practice—preferably in the context of normal classroom activity. This is true not only for science (as discussed in the main article), but for other subject matter. For example, an important part of thinking like a historian is considering the source of a document—who wrote it, when, and why. But teaching students to ask that question, independently of subject matter knowledge, won’t do much good. Knowing that a letter was written by a Confederate private to his wife in New Orleans just after the Battle of Vicksburg won’t help the student interpret the letter—unless he knows something of Civil War history.

- **Critical thinking is not just for advanced students.** I have sometimes heard teachers and administrators suggest that critical thinking exercises make a good enrichment activity for the best students, but struggling students should just be expected to understand and master more basic material. This argument sells short the less advanced students and conflicts with what cognitive scientists know about thinking. Virtually everyone is capable of critical thinking and uses it all the time—and, as the conditional probabilities research demonstrated (see p. 15), has been capable of doing so since they were very young. The difficulty lies not in thinking critically, but in recognizing when to do so, and in knowing enough to do so successfully.

- **Student experiences offer access to complex concepts.** Though critical thinking is to be nested in subject matter, when students don’t have much subject matter knowledge, introducing a concept by listing on student experiences can help. For example, the importance of a source in evaluating a historical document is familiar to even young children; deepening their understanding is a matter of asking questions that they have the knowledge to grapple with. Elementary school teachers could ask: Would a letter to a newspaper editor that criticized the abolishment of recess be viewed differently if written by a school principal versus a third-grader? Various concepts that are central to scientific thinking can also be taught with examples that draw on students’ everyday knowledge and experience. For example, “correlation does not imply causation” is often illustrated by the robust association between the consumption of ice cream and the number of crimes committed on a given day. With a little prodding, students soon realize that ice cream consumption doesn’t cause crime, but high temperatures might cause increases in both.

- **To teach critical thinking strategies, make them explicit and practice them.** Critical thinking strategies are abstractions. A plausible approach to teaching them is to make them explicit, and to proceed in stages. The first time (or several times) the concept is introduced, explain it with at least two different examples (possibly examples based on students’ experiences, as discussed above), label it so as to identify it as a strategy that can be applied in various contexts, and show how it applies to the course content at hand. In future instances, try naming the appropriate critical thinking strategy to see if students remember it and can figure out how it applies to the material under discussion. With still more practice, students may see which strategy applies without a cue from you.

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