

knows. She knows that Christopher Columbus first traveled to North America in 1492 and therefore notes that the author's description of "exploitation" must have occurred during the intervening 150 years. Another student might use self-explanation while reading the passage. He asks himself why trade routes would make Northern Europe "the center of the world." He's unsure of the reason but guesses it might be because of the money that would accrue from booming trade, or perhaps "center of the world" is meant literally as a sort of crossroads.

The students using elaborative interrogation or self-explanation may be able to use other parts of the text to confirm the accuracy of his explanations—or they may not. Even without corrective feedback, these techniques may still help comprehension in two ways.

First, they call attention to the meaning of the text; to implement these techniques, you must first understand what you read. Surprisingly, many students (but especially poor readers) set a low bar for what it means to "understand." If there are no unfamiliar vocabulary words and if each sentence seems sensible, they figure they're getting it (Markman, 1979).

Second, comprehension clearly requires coordinating meaning *across* sentences, and elaborative interrogation and self-explanation encourage that. In addition to aiding comprehension, these techniques help memory by encouraging students to think about meaning. Thinking deeply about meaning is a well-established technique to help cement information into memory (Craik & Tulving, 1975).

The advantage of elaborative interrogation and self-explanation is that students can learn these techniques easily. Teachers do need to model them, but it doesn't take a lot of practice for students to get the idea. The disadvantage

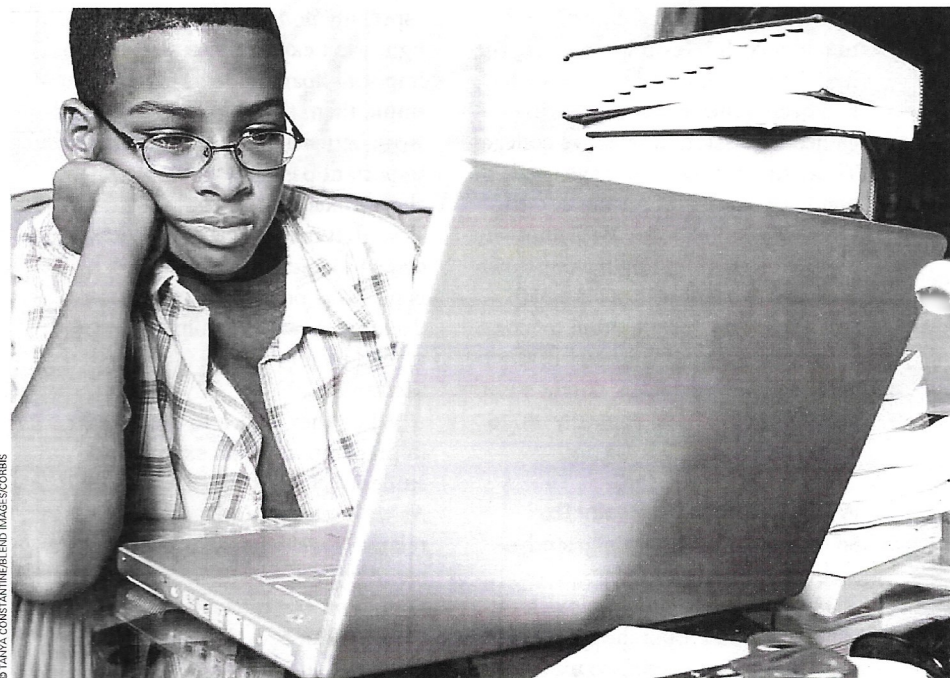
is that they're hard to use if a student has little knowledge about the topic of the text.

Distributed Practice

Suppose a busy high school student decides he'll devote 10 hours to study for an upcoming Spanish test. What would be the best way to allocate those 10 hours? One hour per day for 10 days? Two hours per day for five days? And if he decides, as he's likely to do, to cram most of his study time into the day before the test, what consequences does that strategy have for memory?

each of two occasions, separated by a one-week delay. When everyone was tested a week after they had practiced, all were equally successful in solving problems with the procedure, getting about 70 percent of the problems right. But when tested again three weeks later, those who had all their practice jammed together got, on average, just 32 percent correct, whereas those whose practice was divided into two sessions showed much better recall, scoring, on average, 64 percent correct (Rohrer & Taylor, 2006).

Implementing this strategy is, in



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Cramming practice into the hours right before a test is actually an effective strategy—provided you don't care that you'll swiftly forget what you've learned. For longer retention, spacing practice out is much more effective. In one experiment, college students were taught a new mathematical procedure. Everyone practiced the procedure 10 times, but some students got all 10 problems at once, whereas others got five problems on

one sense, easy—you just separate the study sessions. But by how much? That depends on how long you want to remember the material. Roughly speaking, study sessions should be separated by 10–20 percent of the time that you'd like to remember something. Hence, if you hope to remember something for a year after you last study it, separate your study sessions by 1 or 2 months. Much of the time, our answer to, "How long should