DISCUSSION QUESTIONS

Chapter One

1. What processes is the brain primarily wired for? We think of ourselves as good at solving problems, but our abilities in this arena fall short of even a simple computer's. What kinds of thinking are we better at, and why is this the case?
2. Why and when is cognitive work pleasurable? Can you think of particular instances when you've seen students enjoy an assignment? Do those events share any common characteristics?
3. Why is it useful to think of the primary learning gained from a lesson in terms of a key *question*, rather than just information or an answer?
4. At the end of Chapter One, the author suggests a number of strategies to engage—and keep—students' interest. Are any of these new to you? What are some ways you might incorporate them in your lessons?

Chapter Two

1. Why is thinking reliant on memory? Specifically, what is *working memory*, and what role does it play in cognitive work?
2. What are the limitations of working memory? How can teachers help students overcome those limits?
3. The author demonstrates that background knowledge is necessary to reading comprehension and states that some observers believe it to be a major factor in the differences seen from fourth grade onward between students from privileged versus underprivileged homes. Does this theory makes sense? Why or why not?
4. What is the relationship between background knowledge, "chunking," working memory, and cognitive ability?

Chapter Three

1. How do students' leisure activities affect their reasoning, creativity, and problem-solving abilities? Which activities have the most positive effects, and why?

2. Given the importance of general factual knowledge and the fact that many children do not get enough exposure at home, what are some ways that you might get your students to read more, read more broadly, or otherwise pick up general knowledge?
3. The author defines *memory* as "the residue of thought." What does he mean by this? How can this idea be used to get students to remember what they need to learn?
4. On page 51, the author says that "organizing a lesson plan like a story is an effective way to help students comprehend and remember." Thinking of a lesson you've taught before, how could you reorganize it to give it a story structure?
5. What is the relationship between stories and questions?
6. On page 61, the author advises trying to anticipate what a lesson will (or might) actually make students think about—not just what you intend for them to take away from it. He then relates a story about a class project that went badly awry. Have you had similar experiences? In hindsight, were there any warning signs that you ignored that might have kept the lesson from getting derailed?
7. In the author's view, attention grabbers are often misused. When and how does he think they might be used more effectively than at the beginning of a lesson?
8. Why does the author believe that direction and feedback are important in discovery learning? Do you agree? How can you build this into discovery lessons without taking away the students' sense of exploration and experiment?

Chapter Four

1. The author states that analogies and examples help people understand abstract ideas. Why is this the case?
2. The author defines three types of knowledge: rote, shallow, and deep. What are the differences?
3. Why is deep knowledge so important?
4. Why is it necessary to emphasize deep structure in teaching—and test for it?

Chapter Five

1. On page 83, the author states that "people with more capacity [in

working memory] are better thinkers." How does he suggest we overcome the limits of our working memory?
2. What is the *spacing effect,* and how does it affect students' retention?
3. The author believes that certain types of skills (such as mastery of multiplication tables) can be learned only through practice. What types of general skills or processes does the author recommend having students practice, and how? Can you think of specific ways to implement his suggestions that would make the "drilling" process less onerous and more profitable for students?

Chapter Six

1. The author asserts that experts think and behave differently from novices—even well-trained ones. Can you think of times when you have seen this phenomenon at work? What differences did you notice?
2. What is the difference between knowledge comprehension and knowledge creation? Are both of them appropriate goals for students in the classroom? Why or why not?
3. Do you think someone can become an expert by observing an expert and then doing what that person does? If you do, explain how this process works. If you don't, explain why it doesn't.

Chapter Seven

1. The author discusses Howard Gardner's theory of multiple intelligences and three claims that are made about it: that the eight items in Gardner's list are intelligences and not abilities, that all eight should be taught in school, and that many or all should be used as "conduits" for presenting new materials. What do you think of the theory and these claims?
2. What is the difference between cognitive ability and cognitive style? What is the relevance of each of these concepts to how students learn?
3. What is the "confirmation bias," and how is it related to the theory that some people are visual learners and others auditory learners?
4. Rather than adapting content to different "learning styles," as is often suggested, the author believes presenting different kinds of content using different "teaching styles," or modalities, might be more useful. What do you think of this notion? How might you apply it to your own lessons?

Chapter Eight

1. On page 131, the author asserts that "intelligence can be changed through sustained hard work." Do you accept his premise, or do you think it's a pipe dream? What evidence have you seen that supports your stance?
2. If, as the author says, intelligence is determined by both genetic and environmental factors, do you think one outweighs the other? Which one, and why?
3. The author says that the first step to improving intelligence is to "convince our students that intelligence can be improved" (page 139). How might you go about doing this?
4. What is the value of failure? How might you decrease its negative effects and use students' failures constructively?

Chapter Nine

1. The author suggests that even experienced teachers need practice in teaching. Do you agree? If not, why not? If so, what form might this practice take?
2. The author outlines several things teachers can "practice" to improve their teaching. Which of these seem most doable for you? How much time could you commit to them, and how could you fit them into your schedule?

General Questions

1. The author asserts that the more someone knows, the easier she finds learning. Have you found this to be true in your own experience? Has learning become easier for you over time? Have you noticed this phenomenon in others?
2. How can an understanding of cognitive science help you improve your teaching?
3. In the conclusion to the book the author says, "Teaching is an act of persuasion." What does he mean by this? Do you agree with this idea? What are its implications?