each. The first two behaviors involve changes in deeply ingrained beliefs about roles, responsibilities, and rhythms in the classroom—on the part of both students and teachers. The most important desired outcomes for students are beneath the surface, largely invisible, because they occur in the students' minds. The third and fourth behaviors—scaffolding and making thinking visible—engage the teacher in constructing audible and/or visible supports for student thinking and learning. The resulting scaffolds and other concrete, overt structures direct and channel student thinking, particularly during the early stages of learning.

Thinking Through QQ: Educators, students, and parents all possess memories affecting their beliefs about how teaching and learning should occur. Identify one of these role groups (educators, students, or parents), and reflect on the extent to which your experiences with people in that group demonstrate the impact of their memories on beliefs. Then consider how we can respectfully address this barrier to change.

EXPECT THOUGHTFUL RESPONSES

Most students believe that teachers ask questions in class to surface the "right answers." When pushed, students will say that the right answer equates to the teacher's answer. Robert Fried (2005) includes the following in the first paragraph of *The Game of School*: "You had also better be ready to fake it properly when the teacher calls on you to answer a question to which you're sure he or she already knows the answer" (p. ix). In this book, he argues that few students are authentically engaged in learning in school; most learn how to play by the rules in order to get along and get by. Based upon our observations in hundreds of classrooms across the country, we must agree with Fried. Most students appear to be passive observers in class sessions during which teachers are asking academic questions. If called upon, these students try to provide the answers they think their teachers are seeking.

So how can we reverse this tide? How can we, as teachers, convince students that we intend our questions to be genuine vehicles for their learning? How can we communicate to them that we expect responses that reflect what they think and know about the subject in question so that we (and they) can use this information to move their learning forward? The short answer to these questions is this: We must teach our students these new behaviors; we cannot assume that they will figure them out by themselves. Only by being explicit regarding our expectations for answering will we begin to renorm our classrooms and schools and convince our students that we have a new way of doing the business of classroom questioning. So we recommend that you begin by talking with your students about the following norm.

Norm: Use teacher questions to **prompt** your thinking, not to guess the teacher's answer.

If students are to follow this norm, they must be clear about what thinking is and how it connects to retrieval of information needed to form a response to a teacher question. The following two simple definitions of thinking can be a beginning point for this conversation with students.

1. Thinking is the process of making personal meaning of information and experiences (Barell, 1995, p. 21; Hunkins, 1995, p. 7).
2. Thinking is the process of connection making—of relating a new fact, concept, or experience to what you already know and have stored in your long-term memory (Perkins, 1992, p. 8).

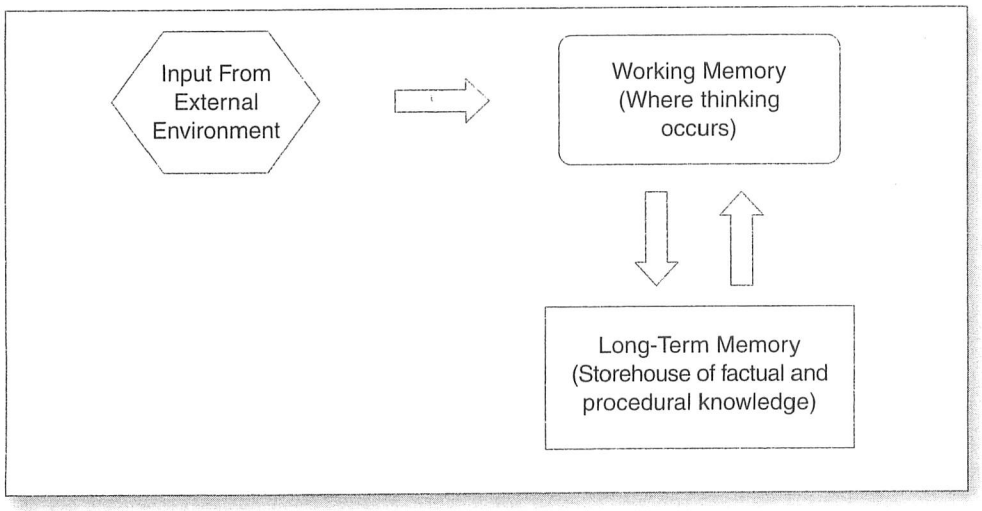
You might begin a dialogue with students by presenting these two definitions and asking them to reflect on each. Ask them to consider (1) what the two have in common, (2) whether they have ever been conscious of trying to make connections between new ideas and existing knowledge, and (3) if they have consciously attempted to make personal meaning when confronted with an academic task.

> Making meaning starts not with answers but with questions. Teachers who wish their students to be skilled at formulating their own meaning and their own understanding realize that lessons should frequently commence not with statements stressing answers but with questions posing puzzles.
>
> —Hunkins (1995, p. 7)

Information about how we learn and process information can motivate students to be more cognizant of their own thinking and how quality questioning supports it. Eric Jensen, Pat Wolfe, Renate and Geoffrey Caine, Judy Willis, and others are making research on brain-based learning accessible to educators. If you have pursued learning in this area, you can transfer this information to the task of helping students better understand thinking and questioning. While we have learned from each of these thought leaders, we focus here on the work of Daniel T. Willingham, author of *Why Don't Students Like School?* In this book, Willingham (2009) offers what he calls "just about the simplest model of the mind possible" (p. 11). It is the simplicity of this model that leads us to recommend it as a resource for increasing students' awareness of their thinking and learning. Figure 3.1 is an adaptation of Willingham's model.

In Willingham's (2009) view, working memory is "synonymous with consciousness; it holds the stuff you're thinking about," which is what you bring in from the external environment and what you retrieve from long-term memory. He writes that "thinking occurs when you combine

Figure 3.1 Model of How Thinking Works



Source: Adapted from Willingham (2009, p. 11).

information (from the environment and long-term memory) in new ways" (p. 11). A teacher- or student-generated question comes to the working memory from the external environment. The question is a catalyst for activation of related facts and procedures residing in long-term memory, for bringing them into the working memory for processing. Teachers can use this model to help students understand how the mind works to make connections between a question and what they know about a topic.

Willingham (2009) emphasizes the importance of questions: "Sometimes I think that we, as teachers, are so eager to get to the answers that we do not devote sufficient time to developing the question" (p. 16). This was our point in the previous chapter: We as teachers need to attend to forming a challenging, interesting, and purposeful question if we are to engage our students' minds in thinking about what is being asked. We agree with Willingham that our questions need to embody puzzles, challenges, or problems that students are motivated to solve—and that they need to engage students at appropriate levels of difficulty. Should our questions fail to meet these two basic criteria, they will fail to trigger the kind of student thinking we are seeking.

As you present these ideas to your students, ask them about the characteristics or qualities of questions that cause them to think. Listen to your students. They will tell you the truth about these matters. We cannot expect them to think about our questions if our questions are not worthy of thought.