The big ideas in mathematics encompass both foundational knowledge and mathematical thinking/problem-solving processes. As outlined in previous chapters, struggling learners often have difficulty with learning mathematics. Therefore, it is incumbent on teachers to explore how these students’ learning difficulties affect their success with mathematics. Although each student possesses unique, individual attributes and characteristics, several common learning difficulties can and do have a negative impact on mathematical learning. This chapter highlights eight learning characteristics that have a negative impact on the learning of mathematics for struggling learners. Each learning characteristic is described, including specific examples of how the learning characteristic affects students’ mathematical understanding. This chapter, in conjunction with Chapters 6 and 7, addresses the second anchor of the Universal Features Model of meaningful mathematics instruction for struggling learners [see Figure 5.1].

EIGHT COMMON CHARACTERISTICS OF STUDENTS WHO STRUGGLE WITH LEARNING MATHEMATICS

Students who have learning difficulties that affect their ability to do well in mathematics come from a variety of backgrounds and experiences. Although each of these students is individual and unique, they share some common learning characteristics. By understanding the impact that these learning characteristics have on learning, teachers can plan and teach more effectively. Struggling learners may experience the negative learning impact of a number of characteristics that are the result of a disability, lack of previous successful experiences in mathematics, and ineffective teaching practices [Chard & Gersten, 1999; Geary, 1993; Ginsburg, 1997; Mercer, Jordan, et al., 1996; Mercer, Lane, et al, 1996; Miller & Mercer, 1997]. The following eight characteristics...
reflect both characteristics that teachers most likely will encounter with students and characteristics that have high potential for having a negative impact on how students learn mathematics:

1. **Learned helplessness:** Students who experience continuous failure in mathematics expect to fail, resulting both in reticence to try something new and reliance on others to help them.

2. **Passive learning:** Struggling learners often are not active learners. They do not actively look for and make connections between what they already know and what they are presently learning. When presented with a problem-
solving situation, they do not implement strategies or activate previous knowledge to solve the problem.

3. **Memory difficulties:** Students with memory difficulties have difficulty with retaining and retrieving information, particularly related to basic addition, subtraction, multiplication, and division facts and multistep sequencing and problem solving.

4. **Attention difficulties:** Learning and doing mathematics requires a great deal of attention, especially when multiple steps are involved in the problem-solving process. During instruction, students who have attention difficulties often miss important pieces of information. When doing mathematics, students may also miss a step due to distractibility, thereby reaching an incorrect solution.

5. **Cognitive/metacognitive thinking deficits:** Metacognition has to do with students’ abilities to monitor their learning, which involves 1) evaluating whether they are learning, 2) implementing strategies when needed, 3) knowing whether a strategy is successful, and 4) making changes when needed. These are essential skills for any problem-solving situation. Students with metacognitive deficits do not use these essential metacognitive thinking skills. Because problem solving is an integral part of mathematics, students who are not metacognitively adept will have great difficulty being successful with mathematics.

6. **Processing deficits:** Students with processing deficits have difficulty accurately perceiving what they see, hear, and/or feel. Many students with learning disabilities possess processing deficits. Their vision and hearing are intact, but their central nervous system processes information differently, leading to misperceptions regarding what they learn. For example, a student with a visual processing deficit may see a mathematics equation accurately, but the visual information that he or she inputs may get distorted when the brain processes it; therefore, what the student sees is not actually what he or she perceives. Other students may require more time to process information that they hear. To them, the teacher seems to talk too fast, when, in actuality, their central nervous system processes at a slower rate.

7. **Low level of academic achievement:** Students who experience failure in mathematics often have holes in their knowledge base. Struggling learners often have these holes for a variety of reasons. For example, students with a visual or auditory processing deficit require a longer time to process visual and auditory information than typical learners. Because of this they often do not have enough time or opportunity to master the foundational concepts and skills that make learning more complex mathematics possible.

8. **Math anxiety:** Struggling learners often approach mathematics with trepidation. Because learning and doing mathematics are difficult for them, “math time” often is an anxiety-ridden experience predisposing them to “shut down” when confronted with learning something new.