

Chapter 25

Strategies for Teaching Math to Middle and High School Students With Special Needs

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ABSTRACT

This chapter is designed to inform and educate 6th- through 12th-grade teachers on how to provide math activities for students with an identified learning disability as defined by the Individuals with Disabilities Education Act. The chapter provides an introduction to the topic, background information on teaching math at the secondary level, research-based instructional strategies that can be used for teaching math to students with identified special needs, and specific manipulatives that can be created and utilized to teach the Common Core State Standards in Mathematics to this population. Additional resources and readings are included as well.

INTRODUCTION

Students who have a learning disability tend to have visual and auditory perception difficulties. Students with a visual perception disability may have perfect eyesight, but when they look at the printed word, the letters, numbers, sentences, or even entire paragraph may be backwards. Students with an auditory disability may have hearing within the normal range, but they may not be able to discriminate between someone speaking to them and normal classroom background noises (feet or papers shuffling, other students whispering in class, etc.), or they may misinterpret the words spoken directly to them. To compensate for these difficulties, general education classroom teachers need to incorporate visual, tactile, and auditory instructional strategies into their lessons. However, incorporating all three senses into one lesson is not typically how general education teachers have been trained to teach during their preservice education (Honeyman, Dang, Thomas, & Waugh, 2016). Frequently, they have been trained

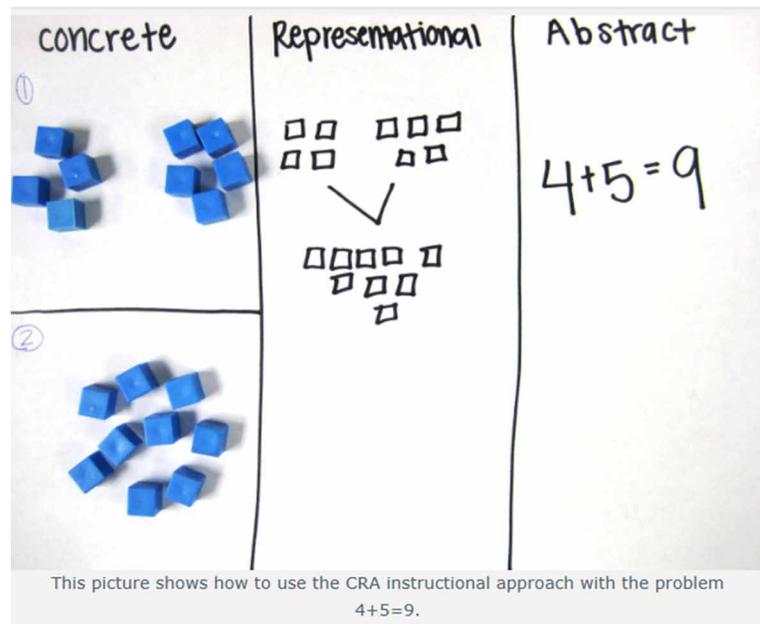
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in academic content but not instructed in pedagogy or in how to teach the content so that all students can learn and grasp the concepts being taught (Honeyman et al., 2016). Due to this lack of information, middle and high school teachers could potentially set up special needs students for failure even before the class begins. Therefore, it is important for all teachers, and as this chapter emphasizes, math teachers in particular, to focus more on hands-on activities (e.g., the use of manipulatives) and visual learning (e.g., the use of computers or graphic organizers) rather than lecturing. Since 65% of the population are visual learners, 30% are auditory, and 5% are kinesthetic, by teaching to all three senses, teachers will be able to teach every student regardless of the student's preferred learning style.

BACKGROUND

When teaching math to middle and high school students with special needs, teachers must remember that these students, like any others, go through three phases of math comprehension: concrete, semi-concrete (or representational), and abstract, or CRA. For example, if a student wanted to find the answer for the problem $4 + 5 = 9$, the three math phases could be illustrated as shown in Figure 1.

Figure 1. Illustration of the three phases of math comprehension



Unfortunately, some students may remain in a particular phase and not reach the highest level. These phases are discussed in more detail below.

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