

Math Counts: Issues That Matter

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UNIVERSAL ACCESS



“All students can learn math, all teachers can successfully teach math, and all parents can support math learning at home.”

Universal Access makes mathematics mastery obtainable to all students, and supports teachers and parents as they help students attain that mastery. The goal of Universal Access is to provide every person with ample and equitable opportunities to approach mathematics. Equity is a key aspect of learning and understanding. *All* students can learn math,

all teachers can successfully teach math, and *all* parents can support math learning at home—the key is to make mathematics *accessible to all*. At the core of Universal Access is the belief of shared responsibility for the preparation of all students for future success among educators, parents, and students (Texas Education Agency).



For Students

As students are expected to learn at higher levels and to attain higher standards in mathematics, educators must provide all students with the opportunity and support to achieve these higher goals. Universal Access ensures that the needs of each student in the classroom are addressed in a manner that allows students to use their own personal

strengths to attain the goals expected of them. Universal Access does not mean that every student receives identical instruction; rather it calls for reasonable and appropriate accommodations to be made to promote access and attainment for all students (*Mathematics Framework for California Public Schools*).

There are five NCTM goals Universal Access helps all students achieve:

- learning to **value** mathematics
- becoming **confident** in their ability to do mathematics
- becoming mathematical **problem solvers**
- learning to **communicate** mathematically
- learning to **reason** mathematically



Access addresses the needs of special student populations, including students of different learning abilities and speakers of different languages.

In *Multiple Intelligences: The Theory in Practice*, Howard Gardner describes seven types of intelligence that students bring to the learning process. These intelligences are used as a basis of identifying learning styles. Students often favor certain intelligences over others. Teachers who are aware of their students' learning styles can readily adapt their teaching to better assist all students.

Universal Access gives teachers the tools to respond to every student's individual instructional needs, including students in different ability groups. Teachers must be able to *differentiate* instruction for students in different ability groups. This allows each student to master the key concepts of his or her grade level, without falling behind due to lack of understanding or facing boredom due to ease of understanding.

Universal Access provides a two-pronged approach to reaching all learners in the classroom. First, Universal Access addresses the different learning styles all students bring to the learning process. Second, Universal



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Learning Style	Abilities	Fostering Methods
Logical	Inherent understanding of logical or mathematical concepts	Give students opportunities to participate in projects and activities that demonstrate the power and usefulness of mathematics
Linguistic	Strong understanding of meaning of words and ability to communicate comfortably and effectively	Encourage students to work in groups to communicate their mathematical ideas and have students write about mathematics
Kinesthetic	Ability to work skillfully with objects using both fine and gross motor skills	Have students work with manipulatives to encourage the concrete representation of mathematics
Visual/Spatial	Ability to accurately understand and perceive the physical world	Give students activities and projects to develop their understanding of mathematics in the physical world
Auditory/Musical	Capacity to appreciate and reproduce rhythmic sounds and pitch	Allow students to hear how sounds are related to mathematics, such as rhythm or pitch and fractions
Social	Capability to understand and respond to the needs of others	Encourage students to collaborate and work together toward a common goal
Individual	Awareness of one's own feelings and thoughts	Encourage students to explain their reasoning and thinking

There are five ability groupings to consider in mathematics instruction:

1. Early Finishers are students who complete work before the remainder of the class. It is important to note that an early finisher is not necessarily a gifted and talented student. These students should be encouraged to slow down and check their work. Ideal activities for these students involve investigating a recently completed problem in another way. Through these activities, students are able to check their initial work as well as strengthen their knowledge of mathematics.

2. Gifted and Talented students are clearly interested in mathematics, master mathematical skills at an early age, understand mathematical reasoning, and are able to perceive mathematical patterns and concepts easily (DeWalle). These students may either enrich what they have learned by delving into a concept in greater depth or they may accelerate what they have learned by moving forward at a rapid pace.

3. Inclusion students are generally performing well below their expected grade level goals. Since these students learn mathematics at a slower pace, the

key concepts for each grade level should be emphasized during the year. Further, care needs to be taken to ensure that any supplementary program complements the instruction given in the classroom so confusion does not arise.

4. Extra Support students perform at slightly below grade level standards, but with support can attain most grade level goals. By spending a longer amount of time with fewer variations on content areas helps these students attain mathematical goals. The key to

this strategy is to teach to the students' strengths and avoid their weaknesses. For instance, if a student is a kinesthetic learner, then manipulatives should be used as often as possible.

5. Language Support students either are English language learners or have weak English language skills. Aural comprehension must be emphasized for these students so they do not fall behind. To assist these students, clearly labeled examples, connections to their native language, and clear visual verbal connections must be made.



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For Teachers

Universal Access must be available for teachers so they are well prepared and adequately supported to teach mathematics. Teachers, more than any other single factor, influence what mathematics students learn and if they master the material. Teachers need to have a strong math background to be confident teaching mathematics. They must have access to ongoing staff

development that is available when it is needed. Staff development at point-of-use allows teachers to refresh their math background immediately prior to teaching the specific content. Effective teaching requires knowing and understanding mathematics skills, procedures, and strategies. Universal Access for teachers allows all teachers to gain and maintain proficiency in these areas.



For Parents

Emphasizing parental involvement at home in math learning is another aspect of Universal Access. Research has shown that the more parents are involved with their children's learning, the more successful children are in school (U.S. Department of Education). Universal Access can help parents understand the skills and procedures used by their children in mathematics learning. To ensure Universal Access, activities suggested to parents should be easy to follow, use everyday materials, and not be overly time consuming. In addition, textbooks must be consistent and easy to follow so parents can readily see the steps their children use for specific skills or procedures. In this way, parents can better understand the skills and procedures their children are using so they can better monitor and assist them. Specific materials created especially for parents to inform them

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of their child's math learning are an ideal bridge between the classroom and home environments. Such materials must be informative, useful, and easy for parents to use. Universal Access helps to guide parents in their efforts with their children, making them more productive (Epstein).

Universal Access is designed to help students attain mathematical standards, help teachers gain a broader understanding of mathematics, and help parents support their children at

home. If all students, teachers, and parents are to be involved in mathematics, a mathematics program must be equitable and accessible.

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