

## MATHEMATICAL PROFICIENCY

Mathematical proficiency captures what is necessary for anyone to learn mathematics successfully. Mathematical proficiency has five components or strands:

***Conceptual Understanding*** – Refers to an integrated and functional grasp of mathematical ideas. Understanding why a mathematical idea is important and the kinds of contexts in which it is useful. It is more than isolated facts and methods.

***Procedural Fluency*** – Refers to knowledge of procedures, knowledge of when and how to use them appropriately, and skill in performing them flexibly, accurately, and efficiently.

***Strategic Competence*** – Refers to the ability to formulate mathematical problems, represent them, and solve them.

***Adaptive Reasoning*** – Refers to the capacity to think logically about the relationships among concepts and situations.

***Productive Disposition*** – Refers to the tendency to see sense in mathematics, to perceive it as both useful and worthwhile, to believe that steady effort in learning mathematics pays off, and to see oneself as an effective learner and doer of mathematics.

These strands are not independent; they represent different aspects of a complex whole. The five strands are interwoven and interdependent in the development of proficiency in mathematics. Mathematical proficiency is not a one-dimensional trait, and it cannot be achieved by focusing on just one or two of these strands.

People sometimes assume that only the brightest students who are the most attuned to school can achieve mathematical proficiency. **Becoming mathematically proficient is necessary and appropriate for ALL students.** As students go from pre-kindergarten to eighth grade, all students should become increasingly proficient in mathematics. That proficiency should enable them to cope with the mathematical challenges of daily life and enable them to continue their study of mathematics in high school and beyond. All will benefit from a program in which mathematical proficiency is the goal.