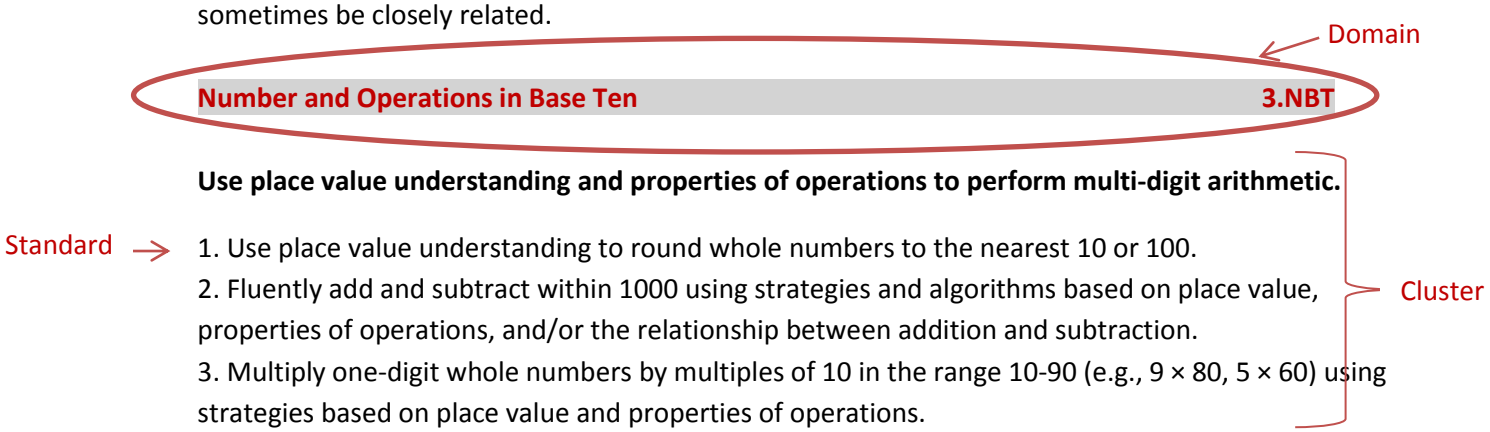
How to Read the Common Core State Standards for Mathematics

The Mathematics Standards are comprised of three main components:

- the **Standards** themselves**,** which define what students should understand and be able to do;
- **Clusters,** which are groups of related standards. (Standards from different clusters may sometimes be closely related, because mathematics is a connected subject).
- **Domains,** which are larger groups of related standards. Standards from different domains may sometimes be closely related.



These Standards do not dictate curriculum or teaching methods. For example, just because topic A appears before topic B in the standards for a given grade, it does not necessarily mean that topic A must be taught before topic B.

The Standards for Mathematical Practices

The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students. These practices rest on important "processes and proficiencies" with longstanding importance in mathematics education. Below is a list of these standards. An explanation of each standard is available on www.corestandards.org.

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

Connecting the Standards for Mathematical Practice to the Standards for Mathematical Content

The Standards for Mathematical Practice describe ways in which developing student practitioners of the discipline of mathematics increasingly ought to engage with the subject matter as they grow in mathematical maturity and expertise throughout the elementary, middle and high school years. Designers of curricula, assessments, and professional development should all attend to the need to connect the mathematical practices to mathematical content in mathematics instruction.

The Standards for Mathematical Content are a balanced combination of procedure and understanding. Expectations that begin with the word "understand" are often especially good opportunities to connect the practices to the content. Students who lack understanding of a topic may rely on procedures too heavily. Without a flexible base from which to work, they may be less likely to consider analogous problems, represent problems coherently, justify conclusions, apply the mathematics to practical situations, use technology mindfully to work with the mathematics, explain the mathematics accurately to other students, step back for an overview, or deviate from a known procedure to find a shortcut. In short, a lack of understanding effectively prevents a student from engaging in the mathematical practices.

In this respect, those content standards which set an expectation of understanding are potential "points of intersection" between the Standards for Mathematical Content and the Standards for Mathematical Practice. These points of intersection are intended to be weighted toward central and generative concepts in the school mathematics curriculum that most merit the time, resources, innovative energies, and focus necessary to qualitatively improve the curriculum, instruction, assessment, professional development, and student achievement in mathematics.

Key Features of the Mathematics Standards

Focus

In each grade, *2-3 topics are focused on deeply* so that students can engage in the mathematical practices, reach strong foundational knowledge and deep conceptual understanding, and transfer mathematical skills and understanding across concepts and grades.

Coherence: Within and Across Grades

Concepts are logically connected from one grade to the next and linked to other major topics within the grade. Each standard is not a new event, but an extension of previous learning.

Rigor: Require fluency, application, and deep understanding

Students are expected to demonstrate deep conceptual understanding of core math concepts, have speed and accuracy in calculation, and use math and choose the appropriate concept for application even when not prompted to do so.

K-5 Grade Standards: Solid Foundation

The K-5 standards provide students with a *solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions and decimals*--which help young students build the foundation to successfully apply more demanding math concepts and procedures and move into applications.

6-8 Grade Standards: Geometry, Algebra, and Probability and Statistics

Having built a strong foundation K-5, students can do *hands on learning* in geometry, algebra and probability and statistics. Students who have completed 7th grade and mastered the content and skills through the 7th grade will be *well-prepared for algebra* in grade 8.

High School Standards: Application

The high school standards call on students to *practice applying mathematical ways of thinking to real world issues and challenges;* they prepare students to think and reason mathematically.