Common Core Standards Mission Statement

http://www.corestandards.org/the-standards/mathematics/introduction/how-to-read-the-grade-level-standards/

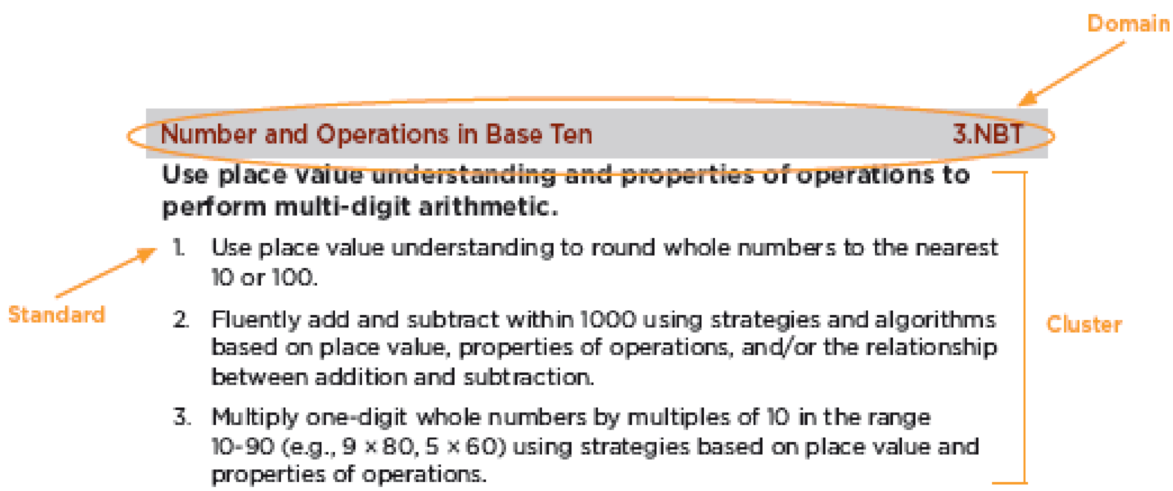
The Common Core State Standards provide a consistent, clear understanding of what students are expected to learn, so teachers and parents know what they need to do to help them. The standards are designed to be robust and relevant to the real world, reflecting the knowledge and skills that our young people need for success in college and careers. With American students fully prepared for the future, our communities will be best positioned to compete successfully in the global economy.

How to read the grade level standards

Standards define what students should understand and be able to do.

Clusters summarize groups of related standards. Note that standards from different clusters may sometimes be closely related, because mathematics is a connected subject.

Domains 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. A teacher might prefer to teach topic B before topic A, or might choose to highlight connections by teaching topic A and topic B at the same time. Or, a teacher might prefer to teach a topic of his or her own choosing that leads, as a byproduct, to students reaching the standards for topics A and B.

What students can learn at any particular grade level depends upon what they have learned before. Ideally then, each standard in this document might have been phrased in the form, "Students who already know A should next come to learn B." But at present this approach is unrealistic—not least because existing education research cannot specify all such learning pathways. Of necessity therefore, grade placements for specific topics have been made on the basis of state and international comparisons and the collective experience and collective professional judgment of educators, researchers and mathematicians. One promise of common state standards is that over time they will allow research on learning progressions to inform and improve the design of standards to a much greater extent than is possible today. Learning opportunities will continue to vary across schools and school systems, and educators should make every effort to meet the needs of individual students based on their current understanding.

These Standards are not intended to be new names for old ways of doing business. They are a call to take the next step. It is time for states to work together to build on lessons learned from two decades of standards based reforms. It is time to recognize that these standards are not just promises to our children, but promises we intend to keep.

Myths vs. Facts

Myths About Content and Quality: General

Myth: Adopting common standards will bring all states' standards down to the lowest common denominator, which means states with high standards, such as Massachusetts, will be taking a step backwards if they adopt the *Standards*.

Fact: The Standards are designed to build upon the most advanced current thinking about preparing all students for success in college and their careers. This will result in moving even the best state standards to the next level. In fact, since this work began, there has been an explicit agreement that no state would lower its standards. The *Standards* were informed by the best in the country, the highest international standards, and evidence and expertise about educational outcomes. We need college and career ready standards because even in high□performing states – students are graduating and passing all the required tests and still require remediation in their postsecondary work.

Myth: The *Standards* are not internationally benchmarked.

Fact: International benchmarking played a significant role in both sets of standards. In fact, the college and career ready standards include an appendix listing the evidence that was consulted in drafting the standards and the international data consulted in the benchmarking process is included in this appendix. More evidence from international sources will be presented together with the final draft.

Myth: The *Standards* only include skills and do not address the importance of content knowledge.

Fact: The *Standards* recognize that both content and skills are important.

In English□language arts, the Standards require certain critical content for all students, including: classic myths and stories from around the world, America's Founding Documents, foundational American literature, and Shakespeare. Appropriately, the remaining crucial decisions about what content should be taught are left to state and local determination. In addition to content coverage, the Standards require that students systematically acquire knowledge in literature and other disciplines through reading, writing, speaking, and listening.

In Mathematics, the *Standards* lay a solid foundation in whole numbers, addition, subtraction, multiplication, division, fractions, and decimals. Taken together, these elements support a student's ability to learn and apply more demanding math concepts and procedures. The middle school and 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. The *Standards* set a rigorous definition of college and career readiness, not by piling topic upon topic, but by demanding that students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.

Myth: The *Standards* suggest teaching "Grapes of Wrath" to second graders.

Fact: The ELA *Standards* suggest "Grapes of Wrath" as a text that would be appropriate for 9^{th} or 10^{th} grade readers. Evidence shows that the complexity of texts students are reading today does not match what is demanded in college and the workplace, creating a gap between what high school students can do and what they need to be able to do. The Common Core State Standards create a staircase of increasing text complexity, so that students are expected to both develop their skills and apply them to more and more complex texts.

Myth: The *Standards* are just vague descriptions of skills; they don't include a reading list or any other similar reference to content.

Fact: The *Standards* do include sample texts that demonstrate the level of text complexity appropriate for the grade level and compatible with the learning demands set out in the *Standards*. The exemplars of high quality texts at each grade level provide a rich set of possibilities and have been very well received. This provides teachers with the flexibility to make their own decisions about what texts to use – while providing an excellent reference point when selecting their texts.

Myth: English teachers will be asked to teach science and social studies reading materials.

Fact: With the Common Core ELA *Standards,* English teachers will still teach their students literature as well as literary non□fiction. However, because college and career readiness overwhelmingly focuses on complex texts outside of literature, these standards also ensure students are being prepared to read, write, and research across the curriculum, including in history and science. These goals can be achieved by ensuring that teachers in other disciplines are also focusing on reading and writing to build knowledge within their subject areas.

Myth: The *Standards* don't have enough emphasis on fiction/literature.

Fact: The *Standards* require certain critical content for all students, including: classic myths and stories from around the world, America's Founding Documents, foundational American literature, and Shakespeare. Appropriately, the remaining crucial decisions about what content should be taught are left to state and local determination. In addition to content coverage, the Standards require that students systematically acquire knowledge in literature and other disciplines through reading, writing, speaking, and listening.

Myths About Content and Quality: Math

Myth: The *Standards* do not prepare or require students to learn Algebra in the 8th grade, as many states' current standards do.

Fact: The *Standards* do accommodate and prepare students for Algebra 1 in 8th grade, by including the prerequisites for this course in grades K–7. Students who master the K–7 material will be able to take Algebra 1 in 8th grade. At the same time, grade 8 standards are also included; these include rigorous algebra and will transition students effectively into a full Algebra 1 course.

Myth: Key math topics are missing or appear in the wrong grade.

Fact: The mathematical progressions presented in the common core are coherent and based on evidence.

Part of the problem with having 50 different sets of state standards is that today, different states cover different topics at different grade levels. Coming to consensus guarantees that from the viewpoint of any given state, topics will move up or down in the grade level sequence. This is unavoidable. What is important to keep in mind is that the progression in the Common Core State Standards is mathematically coherent and leads to college and career readiness at an internationally competitive level.

Myths About Content and Quality: English-language arts

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Myths About Process

Myth: No teachers were involved in writing the *Standards*.

Fact: The common core state standards drafting process relied on teachers and standards experts from across the country. In addition, there were many state experts that came together to create the most thoughtful and transparent process of standard setting. This was only made possible by many states working together.

Myth: The *Standards* are not research or evidence based.

Fact: The *Standards* have made careful use of a large and growing body of evidence. The evidence base includes scholarly research; surveys on what skills are required of students entering college and workforce training programs; assessment data identifying college□and career□ready performance; and comparisons to standards from high□performing states and nations.

In English language arts, the *Standards* build on the firm foundation of the NAEP frameworks in Reading and Writing, which draw on extensive scholarly research and evidence.

In Mathematics, the *Standards* draw on conclusions from TIMSS and other studies of high□performing countries that the traditional US mathematics curriculum must become substantially more coherent and focused in order to improve student achievement, addressing the problem of a curriculum that is “a mile wide and an inch deep.”

Myths About Implementation

Myth: The Standards tell teachers what to teach.

Fact: The best understanding of what works in the classroom comes from the teachers who are in them. That’s why these standards will establish *what* students need to learn, but they will not dictate *how* teachers should teach. Instead, schools and teachers will decide how best to help students reach the standards.

Myth: The Standards will be implemented through No Child Left Behind (NCLB) - signifying that the federal government will be leading them.

Fact: The Common Core State Standards Initiative is a state-led effort that is not part of No Child Left Behind and adoption of the Standards is in no way mandatory. States began the work to create clear, consistent standards before the Recovery Act or the Elementary and Secondary Education Act blueprint was released because this work is being driven by the needs of the states, not the federal government.

The NGA Center and CCSSO are offering support by developing a State Policymaker Guide to Implementation, facilitating opportunities for collaboration among organizations working on implementation, planning the future governance structure of the standards, and convening the publishing community to ensure that high quality materials aligned with the standards are created.

Myth: These *Standards* amount to a national curriculum for our schools.

Fact: The *Standards* are not a curriculum. They are a clear set of shared goals and expectations for what knowledge and skills will help our students succeed. Local teachers, principals, superintendents and others will decide *how* the standards are to be met. Teachers will continue to devise lesson plans and tailor instruction to the individual needs of the students in their classrooms.

Myth: The federal government will take over ownership of the Common Core State Standards Initiative.

Fact: The federal government will not govern the Common Core State Standards Initiative. The Initiative was and will remain a state-led effort. NGA and CCSSO are committed to developing a long-term governance structure with leadership from governors, chief state school officers, and other state policymakers.

Common Core Standards for Mathematical Practice

Source: http://www.corestandards.org/the-standards/mathematics/introduction/standards-for-mathematical-practice/

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. The first of these are the NCTM process standards of problem solving, reasoning and proof, communication, representation, and connections. The second are the strands of mathematical proficiency specified in the National Research Council's report *Adding It Up*: adaptive reasoning, strategic competence, conceptual understanding (comprehension of mathematical concepts, operations and relations), procedural fluency (skill in carrying out procedures flexibly, accurately, efficiently and appropriately), and productive disposition (habitual inclination to see mathematics as sensible, useful, and worthwhile, coupled with a belief in diligence and one's own efficacy).

1. Make sense of problems and persevere in solving them.

Mathematically proficient students start by explaining to themselves the meaning of a problem and looking for entry points to its solution. They analyze givens, constraints, relationships, and goals. They make conjectures about the form and meaning of the solution and plan a solution pathway rather than simply jumping into a solution attempt. They consider analogous problems, and try special cases and simpler forms of the original problem in order to gain insight into its solution. They monitor and evaluate their progress and change course if necessary. Older students might, depending on the context of the problem, transform algebraic expressions or change the viewing window on their graphing calculator to get the information they need. Mathematically proficient students can explain correspondences between equations, verbal descriptions, tables, and graphs or draw diagrams of important features and relationships, graph data, and search for regularity or trends. Younger students might rely on using concrete objects or pictures to help conceptualize and solve a problem. Mathematically proficient students check their answers to problems using a different method, and they continually ask themselves, "Does this make sense?" They can understand the approaches of others to solving complex problems and identify correspondences between different approaches.

2. Reason abstractly and quantitatively.

Mathematically proficient students make sense of quantities and their relationships in problem situations. They bring two complementary abilities to bear on problems involving quantitative relationships: the ability to *decontextualize*—to abstract a given situation and represent it symbolically and manipulate the representing symbols as if they have a life of their own, without necessarily attending to their referents—and the ability to *contextualize*, to pause as needed during the manipulation process in order to probe into the referents for the symbols involved. Quantitative reasoning entails habits of creating a coherent representation of the problem at hand; considering the units involved; attending to the meaning of quantities, not just how to compute them; and knowing and flexibly using different properties of operations and objects.

3. Construct viable arguments and critique the reasoning of others.

Mathematically proficient students understand and use stated assumptions, definitions, and previously established results in constructing arguments. They make conjectures and build a logical progression of statements to explore the truth of their conjectures. They are able to analyze situations by breaking them into cases, and can recognize and use counterexamples. They justify their conclusions, communicate them to others, and respond to the arguments of others. They reason inductively about data, making plausible arguments that take into account the context from which the data arose. Mathematically proficient students are also able to compare the effectiveness of two plausible arguments, distinguish correct logic or reasoning from that which is flawed, and—if there is a flaw in an argument—explain what it is. Elementary students can construct arguments using concrete referents such as objects, drawings, diagrams, and actions. Such arguments can make sense and be correct, even though they are not generalized or made formal until later grades. Later, students learn to determine domains to which an argument applies. Students at all grades can listen or read the arguments of others, decide whether they make sense, and ask useful questions to clarify or improve the arguments.

4. Model with mathematics.

Mathematically proficient students can apply the mathematics they know to solve problems arising in everyday life, society, and the workplace. In early grades, this might be as simple as writing an addition equation to describe a situation. In middle grades, a student might apply proportional reasoning to plan a school event or analyze a problem in the community. By high school, a student might use geometry to solve a design problem or use a function to describe how one quantity of interest depends on another. Mathematically proficient students who can apply what they know are comfortable making assumptions and approximations to simplify a complicated situation, realizing that these may need revision later. They are able to identify important quantities in a practical situation and map their relationships using such tools as diagrams, two-way tables, graphs, flowcharts and formulas. They can analyze those relationships mathematically to draw conclusions. They routinely interpret their mathematical results in the context of the situation and reflect on whether the results make sense, possibly improving the model if it has not served its purpose.

5. Use appropriate tools strategically.

Mathematically proficient students consider the available tools when solving a mathematical problem. These tools might include pencil and paper, concrete models, a ruler, a protractor, a calculator, a spreadsheet, a computer algebra system, a statistical package, or dynamic geometry software. Proficient students are sufficiently familiar with tools appropriate for their grade or course to make sound decisions about when each of these tools might be helpful, recognizing both the insight to be gained and their limitations. For example, mathematically proficient high school students analyze graphs of functions and solutions generated using a graphing calculator. They detect possible errors by strategically using estimation and other mathematical knowledge. When making mathematical models, they know that technology can enable them to visualize the results of varying assumptions, explore consequences, and compare predictions with data. Mathematically proficient students at various grade levels are able to identify relevant external mathematical resources, such as digital content located on a website, and use them to pose or solve problems. They are able to use technological tools to explore and deepen their understanding of concepts.

6. Attend to precision.

Mathematically proficient students try to communicate precisely to others. They try to use clear definitions in discussion with others and in their own reasoning. They state the meaning of the symbols they choose, including using the equal sign consistently and appropriately. They are careful about specifying units of measure, and labeling axes to clarify the correspondence with quantities in a problem. They calculate accurately and efficiently, express numerical answers with a degree of precision appropriate for the problem context. In the elementary grades, students give carefully formulated explanations to each other. By the time they reach high school they have learned to examine claims and make explicit use of definitions.

7. Look for and make use of structure.

Mathematically proficient students look closely to discern a pattern or structure. Young students, for example, might notice that three and seven more is the same amount as seven and three more, or they may sort a collection of shapes according to how many sides the shapes have. Later, students will see 7×8 equals the well remembered $7 \times 5 + 7 \times 3$, in preparation for learning about the distributive property. In the expression $x^2 + 9x + 14$, older students can see the 14 as 2×7 and the 9 as $2 + 7$. They recognize the significance of an existing line in a geometric figure and can use the strategy of drawing an auxiliary line for solving problems. They also can step back for an overview and shift perspective. They can see complicated things, such as some algebraic expressions, as single objects or as being composed of several objects. For example, they can see $5 - 3(x - y)^2$ as 5 minus a positive number times a square and use that to realize that its value cannot be more than 5 for any real numbers x and y.

8. Look for and express regularity in repeated reasoning.

Mathematically proficient students notice if calculations are repeated, and look both for general methods and for shortcuts. Upper elementary students might notice when dividing 25 by 11 that they are repeating the same calculations over and over again, and conclude they have a repeating decimal. By paying attention to the calculation of slope as they repeatedly check whether points are on the line through (1, 2) with slope 3, middle school students might abstract the equation $(y - 2)/(x - 1) = 3$. Noticing the regularity in the way terms cancel when expanding $(x - 1)(x + 1)$, $(x - 1)(x^2 + x + 1)$, and $(x - 1)(x^3 + x2 + x + 1)$ might lead them to the general formula for the sum of a geometric series. As they work to solve a problem, mathematically proficient students maintain oversight of the process, while attending to the details. They continually evaluate the reasonableness of their intermediate results.

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.