

## Introduction to the Common Core State Standards June 2, 2010

The Council of Chief State School Officers (CCSSO) and the National Governors Association Center for Best Practices (NGA Center) are pleased to present the final Kindergarten-12 Common Core State Standards documents that our organizations have produced on behalf of 48 states, two territories, and the District of Columbia. These English language arts and mathematics standards represent a set of expectations for student knowledge and skills that high school graduates need to master to succeed in college and careers.

To develop these standards, CCSSO and the NGA Center worked with representatives from participating states, a wide range of educators, content experts, researchers, national organizations, and community groups. These final standards reflect the invaluable feedback from the general public, teachers, parents, business leaders, states, and content area experts and are informed by the standards of other high performing nations.

You will notice that the college- and career-readiness standards have been incorporated into the K-12 standards, as was promised in the March 10, 2010 draft. The criteria that we used to develop the college- and career-readiness standards, as well as these K-12 standards are:

- Aligned with college and work expectations;
- Include rigorous content *and* application of knowledge through high-order skills;
- Build upon strengths and lessons of current state standards;
- Informed by top-performing countries, so that all students are prepared to succeed in our global economy and society; and,
- Evidence and/or research-based.

The following links provide more information about the criteria and considerations for standards development. The standards development process has incorporated the best practices and research from across the nation and the world. While we have used all available research to shape these documents, we recognize that there is more to be learned about the most essential knowledge for student success. As new research is conducted and we evaluate the implementation of the common core standards, we plan to revise the standards on a set review cycle.

Our organizations would like to thank our advisory group, which provides advice and guidance on this initiative. Additional thanks are also given to the writers of the standards, who devoted countless weekends and late nights to ensuring that the standards meet the high expectations for rigor and clarity.

## Common Core State Standards Initiative Standards-Setting Criteria

The following criteria guided the standards development workgroups in setting the draft college and career readiness standards.

**Preamble:** The Common Core State Standards define the rigorous skills and knowledge in English Language Arts and Mathematics that need to be effectively taught and learned for students to be ready to succeed academically in credit-bearing, college-entry courses and in workforce training programs. These standards have been developed to be:

- Fewer, clearer, and higher, to best drive effective policy and practice;
- Aligned with college and work expectations, so that all students are prepared for success upon graduating from high school;
- Inclusive of rigorous content and applications of knowledge through higher-order skills, so that all students are prepared for the 21<sup>st</sup> century;
- Internationally benchmarked, so that all students are prepared for succeeding in our global economy and society; and
- Research and evidence-based.

The standards intend to set forward thinking goals for student performance based in evidence about what is required for success. The standards developed will set the stage for US education not just beyond next year, but for the next decade, and they must ensure *all* American students are prepared for the global economic workplace. Furthermore, the standards created will not lower the bar but raise it for all students; as such, we cannot narrow the college-ready focus of the standards to just preparation of students for college algebra and English composition and therefore will seek to ensure all students are prepared for all entry-level, credit-bearing, academic college courses in English, mathematics, the sciences, the social sciences, and the humanities. The objective is for all students to enter these classes ready for success (defined for these purposes as a C or better).

**Goal:** The standards as a whole must be essential, rigorous, clear and specific, coherent, and internationally benchmarked.

**Essential:** The standards must be reasonable in scope in defining the knowledge and skills students should have to be ready to succeed in entry-level, credit-bearing, academic college courses and in workforce training programs.

Workforce training programs pertain to careers that:

- 1) Offer competitive, livable salaries above the poverty line
- 2) Offer opportunities for career advancement
- 3) Are in a growing or sustainable industry



College refers to two- and four-year postsecondary schools

Entry-level, credit-bearing, academic college courses (e.g. English, mathematics, sciences, social sciences, humanities)

**Rigorous:** The standards will include high-level cognitive demands by asking students to demonstrate deep conceptual understanding through the application of content knowledge and skills to new situations.

High-level cognitive demand includes reasoning, justification, synthesis, analysis, and problem-solving.

**Clear and Specific:** The standards should provide sufficient guidance and clarity so that they are teachable, learnable, and measurable. The standards will also be clear and understandable to the general public.

Quality standards are precise and provide sufficient detail to convey the level of performance expected without being overly prescriptive. (the "what" not the "how"). The standards should maintain a relatively consistent level of grain size.

**Teachable and learnable:** Provide sufficient guidance for the design of curricula and instructional materials. The standards must be reasonable in scope, instructionally manageable, and promote depth of understanding.

The standards will not prescribe *how* they are taught and learned but will allow teachers flexibility to teach and students to learn in various instructionally relevant contexts.

**Measureable:** Student attainment of the standards should be observable and verifiable and the standards can be used to develop broader assessment frameworks

**Coherent:** The standards should convey a unified vision of the big ideas and supporting concepts within a discipline and reflect a progression of learning that is meaningful and appropriate.

**Grade-by-grade standards:** The standards will have limited repetition across the grades or grade spans to help educators align instruction to the standards.

**Internationally benchmarked:** The standards will be informed by the content, rigor, and organization of standards of high-performing countries so that all students are prepared for succeeding in our global economy and society.

## Common Core State Standards Initiative Standards-Setting Considerations

The following considerations guided the standards development workgroups in setting the draft college and career readiness standards.

**Fewer, clearer, higher:** One of the goals of this process was to produce a set of fewer, clearer and higher standards. It is critical that any standards document be translatable to and teachable in the classroom. As such, the standards must cover only those areas that are critical for student success. This meant making tough decisions about what to include in the standards; however, these choices were important to ensure the standards are useable by teachers.

**Evidence:** This work has made unprecedented use of evidence in deciding what to include – or not include – in the standards. Each document includes a brief narrative on the choices that were made based on evidence. Rather than focusing on the *opinions* of experts exclusively, evidence to guide the decisions about what to include in the standards was used. This is a key difference between this process and the processes that have come before.

**Internationally benchmarked:** These standards are informed by the content, rigor and organization of standards of high-performing countries and states so that all students are prepared to succeed in a global economy and society.

**Special populations:** In the development of these standards, the inclusion of all types of learners was a priority. Writers selected language intended to make the standards documents accessible to different learners.

**Assessment:** While an assessment of the common core state standards is not currently being developed, these standards will ultimately be the basis for an assessment system that would include multiple measures of student performance. Once states agree on the final standards, attention will be turned to creating a high quality system of measurement that would include proper incentives for teachers to teach these standards and a variety of assessments that will reinforce teaching and learning tied to the agreed upon expectations.

**Standards and curriculum:** Standards are not curriculum. This initiative is about developing a set of standards that are common across states. The curriculum that follows will continue to be a local responsibility (or state-led, where appropriate). The curriculum could become more consistent from state to state based on the commonality of the standards; however, there are multiple ways to teach these standards, and therefore, there will be multiple approaches that could help students accomplish the goals set out in the standards.

**21<sup>st</sup> century skills:** These documents are not an attempt to demonstrate everything that a student should learn; rather, we have focused on two areas – English-language Arts and Mathematics. The standards have incorporated 21<sup>st</sup> century skills where possible. They are not inclusive of all the skills students need for success in the 21<sup>st</sup> Century, but many of these skills will be required across disciplines.

## About the Standards

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The Common Core State Standards Initiative is a state-led effort coordinated by the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO). The standards were developed in collaboration with teachers, school administrators, and experts, to provide a clear and consistent framework to prepare our children for college and the workforce.

The NGA Center and CCSSO received initial feedback on the draft standards from national organizations representing, but not limited to, teachers, postsecondary educators (including community colleges), civil rights groups, English language learners, and students with disabilities. Following the initial round of feedback, the draft standards were opened for public comment, receiving nearly 10,000 responses.

The standards are informed by the highest, most effective models from states across the country and countries around the world, and provide teachers and parents with a common understanding of what students are expected to learn. Consistent standards will provide appropriate benchmarks for all students, regardless of where they live.

These standards define the knowledge and skills students should have within their K-12 education careers so that they will graduate high school able to succeed in entry-level, credit-bearing academic college courses and in workforce training programs. The standards:

- Are aligned with college and work expectations;
- Are clear, understandable and consistent;
- Include rigorous content and application of knowledge through high-order skills;
- Build upon strengths and lessons of current state standards;
- Are informed by other top performing countries, so that all students are prepared to succeed in our global economy and society; and
- Are evidence-based.



## Key Points In Mathematics

- 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.
- In kindergarten, the standards follow successful international models and recommendations from the National Research Council's Early Math Panel report, by focusing kindergarten work on the number core: learning how numbers correspond to quantities, and learning how to put numbers together and take them apart (the beginnings of addition and subtraction).
- The K-5 standards build on the best state standards to provide detailed guidance to teachers on how to navigate their way through knotty topics such as fractions, negative numbers, and geometry, and do so by maintaining a continuous progression from grade to grade.
- The standards stress not only procedural skill but also conceptual understanding, to make sure students are learning and absorbing the critical information they need to succeed at higher levels - rather than the current practices by which many students learn enough to get by on the next test, but forget it shortly thereafter, only to review again the following year.
- 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.
- The middle school standards are robust and provide a coherent and rich preparation for high school mathematics.
- 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.
- The high school standards set a rigorous definition of college and career readiness, by helping students develop a depth of understanding and ability to apply mathematics to novel situations, as college students and employees regularly do.
- The high school standards emphasize mathematical modeling, the use of mathematics and statistics to analyze empirical situations, understand them better, and improve decisions. For example, the draft standards state: "Modeling links classroom mathematics and statistics to everyday life, work, and decision-making. It is the process of choosing and using appropriate mathematics and statistics to analyze empirical situations, to understand them better, and to improve decisions. Quantities and their relationships in physical, economic, public policy, social and everyday situations can be modeled using mathematical and statistical methods. When making mathematical models, technology is valuable for varying assumptions, exploring consequences, and comparing predictions with data."

## Key Points In English Language Arts

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### Reading

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- The standards establish a “staircase” of increasing complexity in what students must be able to read so that all students are ready for the demands of college- and career-level reading no later than the end of high school. The standards also require the progressive development of reading comprehension so that students advancing through the grades are able to gain more from whatever they read.
- Through reading a diverse array of classic and contemporary literature as well as challenging informational texts in a range of subjects, students are expected to build knowledge, gain insights, explore possibilities, and broaden their perspective. Because the standards are building blocks for successful classrooms, but recognize that teachers, school districts and states need to decide on appropriate curriculum, they intentionally do not offer a reading list. Instead, they offer numerous sample texts to help teachers prepare for the school year and allow parents and students to know what to expect at the beginning of the year.
- The standards mandate certain critical types of content for all students, including classic myths and stories from around the world, foundational U.S. documents, seminal works of American literature, and the writings of Shakespeare. The standards appropriately defer the many remaining decisions about what and how to teach to states, districts, and schools.

### Writing

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- The ability to write logical arguments based on substantive claims, sound reasoning, and relevant evidence is a cornerstone of the writing standards, with opinion writing—a basic form of argument—extending down into the earliest grades.
- Research—both short, focused projects (such as those commonly required in the workplace) and longer term in depth research—is emphasized throughout the standards but most prominently in the writing strand since a written analysis and presentation of findings is so often critical.
- Annotated samples of student writing accompany the standards and help establish adequate performance levels in writing arguments, informational/explanatory texts, and narratives in the various grades.

### Speaking and Listening

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- The standards require that students gain, evaluate, and present increasingly complex information, ideas, and evidence through listening and speaking as well as through media.
- An important focus of the speaking and listening standards is academic discussion in one-on-one, small-group, and whole-class settings. Formal presentations are one important way such talk occurs, but so is the more informal discussion that takes place as students collaborate to answer questions, build understanding, and solve problems.

### Language

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- The standards expect that students will grow their vocabularies through a mix of conversations, direct instruction, and reading. The standards will help students determine word meanings, appreciate the nuances of words, and steadily expand their repertoire of words and phrases.
- The standards help prepare students for real life experience at college and in 21st century careers. The standards recognize that students must be able to use formal English in their writing and speaking but that they must also be able to make informed, skilful choices among the many ways to express themselves through language.
- Vocabulary and conventions are treated in their own strand not because skills in these areas should be handled in isolation but because their use extends across reading, writing, speaking, and listening.

### Media and Technology

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- Just as media and technology are integrated in school and life in the twenty-first century, skills related to media use (both critical analysis and production of media) are integrated throughout the standards.



# COMMON CORE STATE STANDARDS      FOR

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English Language Arts  
&  
Literacy in History/Social Studies,  
Science, and Technical Subjects



# Introduction

The Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, and Technical Subjects ("the Standards") are the culmination of an extended, broad-based effort to fulfill the charge issued by the states to create the next generation of K-12 standards in order to help ensure that all students are college and career ready in literacy no later than the end of high school.

The present work, led by the Council of Chief State School Officers (CCSSO) and the National Governors' Association (NGA), builds on the foundation laid by states in their decades-long work on crafting high-quality education standards. The Standards also draw on the most important international models as well as research and input from numerous sources, including state departments of education, scholars, assessment developers, professional organizations, educators from kindergarten through college, and parents, students, and other members of the public. In their design and content, refined through successive drafts and numerous rounds of feedback, the Standards represent a synthesis of the best elements of standards-related work to date and an important advance over that previous work.

As specified by CCSSO and NGA, the Standards are (1) research and evidence based, (2) aligned with college and work expectations, (3) rigorous, and (4) internationally benchmarked. A particular standard was included in the document only when the best available evidence indicated that its mastery was essential for college and career readiness in a twenty-first-century, globally competitive society. The Standards are intended to be a living work: as new and better evidence emerges, the Standards will be revised accordingly.

The Standards are an extension of a prior initiative led by CCSSO and NGA to develop College and Career Readiness (CCR) standards in reading, writing, speaking, listening, and language as well as in mathematics. The CCR Reading, Writing, and Speaking and Listening Standards, released in draft form in September 2009, serve, in revised form, as the backbone for the present document. Grade-specific K-12 standards in reading, writing, speaking, listening, and language translate the broad (and, for the earliest grades, seemingly distant) aims of the CCR standards into age- and attainment-appropriate terms.

The Standards set requirements not only for English language arts (ELA) but also for literacy in history/social studies, science, and technical subjects. Just as students must learn to read, write, speak, listen, and use language effectively in a variety of content areas, so too must the Standards specify the literacy skills and understandings required for college and career readiness in multiple disciplines. Literacy standards for grade 6 and above are predicated on teachers of ELA, history/social studies, science, and technical subjects using their content area expertise to help students meet the particular challenges of reading, writing, speaking, listening, and language in their respective fields. It is important to note that the 6-12 literacy standards in history/social studies, science, and technical subjects are not meant to replace content standards in those areas but rather to supplement them. States may incorporate these standards into their standards for those subjects or adopt them as content area literacy standards.

As a natural outgrowth of meeting the charge to define college and career readiness, the Standards also lay out a vision of what it means to be a literate person in the twenty-first century. Indeed, the skills and understandings students are expected to demonstrate have wide applicability outside the classroom or workplace. Students who meet the Standards readily undertake the close, attentive reading that is at the heart of understanding and enjoying complex works of literature. They habitually perform the critical reading necessary to pick carefully through the staggering amount of information available today in print and digitally. They actively seek the wide, deep, and thoughtful engagement with high-quality literary and informational texts that builds knowledge, enlarges experience, and broadens worldviews. They reflexively demonstrate the cogent reasoning and use of evidence that is essential to both private deliberation and responsible citizenship in a democratic republic. In short, students who meet the Standards develop the skills in reading, writing, speaking, and listening that are the foundation for any creative and purposeful expression in language.

June 2, 2010



## Key Design Considerations

### CCR and grade-specific standards

The CCR standards anchor the document and define general, cross-disciplinary literacy expectations that must be met for students to be prepared to enter college and workforce training programs ready to succeed. The K-12 grade-specific standards define end-of-year expectations and a cumulative progression designed to enable students to meet college and career readiness expectations no later than the end of high school. The CCR and high school (grades 9-12) standards work in tandem to define the college and career readiness line—the former providing broad standards, the latter providing additional specificity. Hence, both should be considered when developing college and career readiness assessments.

Students advancing through the grades are expected to meet each year's grade-specific standards, retain or further develop skills and understandings mastered in preceding grades, and work steadily toward meeting the more general expectations described by the CCR standards.

### Grade levels for K-8; grade bands for 9-10 and 11-12

The Standards use individual grade levels in kindergarten through grade 8 to provide useful specificity; the Standards use two-year bands in grades 9-12 to allow schools, districts, and states flexibility in high school course design.

### A focus on results rather than means

By emphasizing required achievements, the Standards leave room for teachers, curriculum developers, and states to determine how those goals should be reached and what additional topics should be addressed. Thus, the Standards do not mandate such things as a particular writing process or the full range of metacognitive strategies that students may need to monitor and direct their thinking and learning. Teachers are thus free to provide students with whatever tools and knowledge their professional judgment and experience identify as most helpful for meeting the goals set out in the Standards.

### An integrated model of literacy

Although the Standards are divided into Reading, Writing, Speaking and Listening, and Language strands for conceptual clarity, the processes of communication are closely connected, as reflected throughout this document. For example, Writing standard 9 requires that students be able to write about what they read. Likewise, Speaking and Listening standard 4 sets the expectation that students will share findings from their research.

### Research and media skills blended into the Standards as a whole

To be ready for college, workforce training, and life in a technological society, students need the ability to gather, comprehend, evaluate, synthesize, and report on information and ideas, to conduct original research in order to answer questions or solve problems, and to analyze and create a high volume and extensive range of print and nonprint texts in media forms old and new. The need to conduct research and to produce and consume media is embedded into every aspect of today's curriculum. In like fashion, research and media skills and understandings are embedded throughout the Standards rather than treated in a separate section.

### Shared responsibility for students' literacy development

The Standards insist that instruction in reading, writing, speaking, listening, and language be a shared responsibility within the school. The K-5 standards include expectations for reading, writing, speaking, listening, and language applicable to a range of subjects, including but not limited to ELA. The grades 6-12 standards are divided into two sections, one for ELA and the other for history/social studies, science, and technical subjects. This division reflects the unique, time-honored place of ELA teachers in developing students' literacy skills while at the same time recognizing that teachers in other areas must have a role in this development as well.

Part of the motivation behind the interdisciplinary approach to literacy promulgated by the Standards is extensive research establishing the need for college and career ready students to be proficient in reading complex informational text independently in a variety of content areas. Most of the required reading in college and workforce training programs is informational in structure and challenging in content; postsecondary education programs typically provide students with both a higher volume of such reading than is generally required in K-12 schools and comparatively little scaffolding.

The Standards are not alone in calling for a special emphasis on informational text. The 2009 reading framework of the National Assessment of Educational Progress (NAEP) requires a high and increasing proportion of informational text on its assessment as students advance through the grades.



## Distribution of Literary and Informational Passages by Grade in the 2009 NAEP Reading Framework

Grade	Literary	Informational
4	50%	50%
8	40%	60%
12	30%	70%

Source: National Assessment Governing Board. (2008). *Reading framework for the 2009 National Assessment of Educational Progress*. Washington, DC: U.S. Government Printing Office.

The Standards aim to align instruction with this framework so that many more students than at present can meet the requirements of college and career readiness. In K-5, the Standards follow NAEP's lead in balancing the reading of literature with the reading of informational texts, including texts in history/social studies, science, and technical subjects. In accord with NAEP's growing emphasis on informational texts in the higher grades, the Standards demand that a significant amount of reading of informational texts take place in and outside the ELA classroom. Fulfilling the Standards for 6-12 ELA requires much greater attention to a specific category of informational text—literary nonfiction—than has been traditional. Because the ELA classroom must focus on literature (stories, drama, and poetry) as well as literary nonfiction, a great deal of informational reading in grades 6-12 must take place in other classes if the NAEP assessment framework is to be matched instructionally.<sup>1</sup> To measure students' growth toward college and career readiness, assessments aligned with the Standards should adhere to the distribution of texts across grades cited in the NAEP framework.

NAEP likewise outlines a distribution across the grades of the core purposes and types of student writing. The 2011 NAEP framework, like the Standards, cultivates the development of three mutually reinforcing writing capacities: writing to persuade, to explain, and to convey real or imagined experience. Evidence concerning the demands of college and career readiness gathered during development of the Standards concurs with NAEP's shifting emphases: standards for grades 9-12 describe writing in all three forms, but, consistent with NAEP, the overwhelming focus of writing throughout high school should be on arguments and informative/explanatory texts.<sup>2</sup>

<sup>1</sup>The percentages on the table reflect the sum of student reading, not just reading in ELA settings. Teachers of senior English classes, for example, are not required to devote 70 percent of reading to informational texts. Rather, 70 percent of student reading across the grade should be informational.

<sup>2</sup>As with reading, the percentages in the table reflect the sum of student writing, not just writing in ELA settings.

## Distribution of Communicative Purposes by Grade in the 2011 NAEP Writing Framework

Grade	To Persuade	To Explain	To Convey Experience
4	30%	35%	35%
8	40%	40%	20%

Source: National Assessment Governing Board. (2007). *Writing framework for the 2011 National Assessment of Educational Progress*. pre-publication edition. Iowa City, IA: ACT, Inc.

It follows that writing assessments aligned with the Standards should adhere to the distribution of writing purposes across grades outlined by NAEP.

## Focus and coherence in instruction and assessment

While the Standards delineate specific expectations in reading, writing, speaking, listening, and language, each standard need not be a separate focus for instruction and assessment. Often, several standards can be addressed by a single rich task. For example, when editing writing, students address Writing standard 5 ("Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach") as well as Language standards 1-3 (which deal with conventions of standard English and knowledge of language). When drawing evidence from literary and informational texts per Writing standard 9, students are also demonstrating their comprehension skill in relation to specific standards in Reading. When discussing something they have read or written, students are also demonstrating their speaking and listening skills. The CCR anchor standards themselves provide another source of focus and coherence.

The same ten CCR anchor standards for Reading apply to both literary and informational texts, including texts in history/social studies, science, and technical subjects. The ten CCR anchor standards for Writing cover numerous text types and subject areas. This means that students can develop mutually reinforcing skills and exhibit mastery of standards for reading and writing across a range of texts and classrooms.

## What is Not Covered by the Standards

The Standards should be recognized for what they are not as well as what they are. The most important intentional design limitations are as follows:

1. The Standards define what all students are expected to know and be able to do, not how teachers should teach. For instance, the use of play with young children is not specified by the Standards, but it is welcome as a valuable activity in its own right and as a way to help students meet the expectations in this document. Furthermore, while the Standards make references to some particular forms of content, including mythology, foundational U.S. documents, and Shakespeare, they do not—indeed, cannot—enumerate all or even most of the content that students should learn. The Standards must therefore be complemented by a well-developed, content-rich curriculum consistent with the expectations laid out in this document.
2. While the Standards focus on what is most essential, they do not describe all that can or should be taught. A great deal is left to the discretion of teachers and curriculum developers. The aim of the Standards is to articulate the fundamentals, not to set out an exhaustive list or a set of restrictions that limits what can be taught beyond what is specified herein.
3. The Standards do not define the nature of advanced work for students who meet the Standards prior to the end of high school. For those students, advanced work in such areas as literature, composition, language, and journalism should be available. This work should provide the next logical step up from the college and career readiness baseline established here.
4. The Standards set grade-specific standards but do not define the intervention methods or materials necessary to support students who are well below or well above grade-level expectations. No set of grade-specific standards can fully reflect the great variety in abilities, needs, learning rates, and achievement levels of students in any given classroom. However, the Standards do provide clear signposts along the way to the goal of college and career readiness for all students.
5. It is also beyond the scope of the Standards to define the full range of supports appropriate for English language learners and for students with special needs. At the same time, all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-high school lives.  
  
Each grade will include students who are still acquiring English. For those students, it is possible to meet the standards in reading, writing, speaking, and listening without displaying native-like control of conventions and vocabulary.  
  
The Standards should also be read as allowing for the widest possible range of students to participate fully from the outset and as permitting appropriate accommodations to ensure maximum participation of students with special education needs. For example, for students with disabilities reading should allow for the use of Braille, screen-reader technology, or other assistive devices, while writing should include the use of a scribe, computer, or speech-to-text technology. In a similar vein, speaking and listening should be interpreted broadly to include sign language.
6. While the ELA and content area literacy components described herein are critical to college and career readiness, they do not define the whole of such readiness. Students require a wide-ranging, rigorous academic preparation and, particularly in the early grades, attention to such matters as social, emotional, and physical development and approaches to learning. Similarly, the Standards define literacy expectations in history/social studies, science, and technical subjects, but literacy standards in other areas, such as mathematics and health education, modeled on those in this document are strongly encouraged to facilitate a comprehensive, schoolwide literacy program.



## Students Who are College and Career Ready in Reading, Writing, Speaking, Listening, and Language

The descriptions that follow are not standards themselves but instead offer a portrait of students who meet the standards set out in this document. As students advance through the grades and master the standards in reading, writing, speaking, listening, and language, they are able to exhibit with increasing fullness and regularity these capacities of the literate individual.

### They demonstrate independence.

Students can, without significant scaffolding, comprehend and evaluate complex texts across a range of types and disciplines, and they can construct effective arguments and convey intricate or multifaceted information. Likewise, students are able independently to discern a speaker's key points, request clarification, and ask relevant questions. They build on others' ideas, articulate their own ideas, and confirm they have been understood. Without prompting, they demonstrate command of standard English and acquire and use a wide-ranging vocabulary. More broadly, they become self-directed learners, effectively seeking out and using resources to assist them, including teachers, peers, and print and digital reference materials.

### They build strong content knowledge.

Students establish a base of knowledge across a wide range of subject matter by engaging with works of quality and substance. They become proficient in new areas through research and study. They read purposefully and listen attentively to gain both general knowledge and discipline-specific expertise. They refine and share their knowledge through writing and speaking.

### They respond to the varying demands of audience, task, purpose, and discipline.

Students adapt their communication in relation to audience, task, purpose, and discipline. They set and adjust purpose for reading, writing, speaking, listening, and language use as warranted by the task. They appreciate nuances, such as how the composition of an audience should affect tone when speaking and how the connotations of words affect meaning. They also know that different disciplines call for different types of evidence (e.g., documentary evidence in history, experimental evidence in science).

### They comprehend as well as critique.

Students are engaged and open-minded—but discerning—readers and listeners. They work diligently to understand precisely what an author or speaker is saying, but they also question an author's or speaker's assumptions and premises and assess the veracity of claims and the soundness of reasoning.

### They value evidence.

Students cite specific evidence when offering an oral or written interpretation of a text. They use relevant evidence when supporting their own points in writing and speaking, making their reasoning clear to the reader or listener, and they constructively evaluate others' use of evidence.

### They use technology and digital media strategically and capably.

Students employ technology thoughtfully to enhance their reading, writing, speaking, listening, and language use. They tailor their searches online to acquire useful information efficiently, and they integrate what they learn using technology with what they learn offline. They are familiar with the strengths and limitations of various technological tools and mediums and can select and use those best suited to their communication goals.

### They come to understand other perspectives and cultures.

Students appreciate that the twenty-first-century classroom and workplace are settings in which people from often widely divergent cultures and who represent diverse experiences and perspectives must learn and work together. Students actively seek to understand other perspectives and cultures through reading and listening, and they are able to communicate effectively with people of varied backgrounds. They evaluate other points of view critically and constructively. Through reading great classic and contemporary works of literature representative of a variety of periods, cultures, and worldviews, students can vicariously inhabit worlds and have experiences much different than their own.



## How to Read This Document

### Overall Document Organization

The Standards comprise three main sections: a comprehensive K-5 section and two content area-specific sections for grades 6-12, one for ELA and one for history/social studies, science, and technical subjects. Three appendices accompany the main document.

Each section is divided into strands. K-5 and 6-12 ELA have Reading, Writing, Speaking and Listening, and Language strands; the 6-12 history/social studies, science, and technical subjects section focuses on Reading and Writing. Each strand is headed by a strand-specific set of College and Career Readiness Anchor Standards that is identical across all grades and content areas.

Standards for each grade within K-8 and for grades 9-10 and 11-12 follow the CCR anchor standards in each strand. Each grade-specific standard (as these standards are collectively referred to) corresponds to the same-numbered CCR anchor standard. Put another way, each CCR anchor standard has an accompanying grade-specific standard translating the broader CCR statement into grade-appropriate end-of-year expectations.

Individual CCR anchor standards can be identified by their strand, CCR status, and number (RCCR.6, for example). Individual grade-specific standards can be identified by their strand, grade, and number (or number and letter, where applicable), so that RI.4.3, for example, stands for Reading, Informational Text, grade 4, standard 3 and W.5.1a stands for Writing, grade 5, standard 1a. Strand designations can be found in brackets alongside the full strand title.

### Who is responsible for which portion of the Standards

A single K-5 section lists standards for reading, writing, speaking, listening, and language across the curriculum, reflecting the fact that most or all of the instruction students in these grades receive comes from one teacher. Grades 6-12 are covered in two content area-specific sections, the first for the English language arts teacher and the second for teachers of history/social studies, science, and technical subjects. Each section uses the same CCR anchor standards but also includes grade-specific standards tuned to the literacy requirements of the particular discipline(s).

### Key Features of the Standards

#### Reading: Text complexity and the growth of comprehension

The Reading standards place equal emphasis on the sophistication of what students read and the skill with which they read. Standard 10 defines a grade-by-grade "staircase" of increasing text complexity that rises from beginning reading

to the college and career readiness level. Whatever they are reading, students must also show a steadily growing ability to discern more from and make fuller use of text, including making an increasing number of connections among ideas and between texts, considering a wider range of textual evidence, and becoming more sensitive to inconsistencies, ambiguities, and poor reasoning in texts.

#### Writing: Text types, responding to reading, and research

The Standards acknowledge the fact that whereas some writing skills, such as the ability to plan, revise, edit, and publish, are applicable to many types of writing, other skills are more properly defined in terms of specific writing types: arguments, informative/explanatory texts, and narratives. Standard 9 stresses the importance of the writing-reading connection by requiring students to draw upon and write about evidence from literary and informational texts. Because of the centrality of writing to most forms of inquiry, research standards are prominently included in this strand, though skills important to research are infused throughout the document.

#### Speaking and Listening: Flexible communication and collaboration

Including but not limited to skills necessary for formal presentations, the Speaking and Listening standards require students to develop a range of broadly useful oral communication and interpersonal skills. Students must learn to work together, express and listen carefully to ideas, integrate information from oral, visual, quantitative, and media sources, evaluate what they hear, use media and visual displays strategically to help achieve communicative purposes, and adapt speech to context and task.

#### Language: Conventions, effective use, and vocabulary

The Language standards include the essential "rules" of standard written and spoken English, but they also approach language as a matter of craft and informed choice among alternatives. The vocabulary standards focus on understanding words and phrases, their relationships, and their nuances and on acquiring new vocabulary, particularly general academic and domain-specific words and phrases.

### Appendices A, B, and C

Appendix A contains supplementary material on reading, writing, speaking and listening, and language as well as a glossary of key terms. Appendix B consists of text exemplars illustrating the complexity, quality, and range of reading appropriate for various grade levels with accompanying sample performance tasks. Appendix C includes annotated samples demonstrating at least adequate performance in student writing at various grade levels.

# COMMON CORE STATE STANDARDS FOR

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## Mathematics



# Introduction

## Toward greater focus and coherence

*Mathematics experiences in early childhood settings should concentrate on (1) number (which includes whole number, operations, and relations) and (2) geometry, spatial relations, and measurement, with more mathematics learning time devoted to number than to other topics. Mathematical process goals should be integrated in these content areas.*

— Mathematics Learning in Early Childhood, National Research Council, 2009

*The composite standards [of Hong Kong, Korea and Singapore] have a number of features that can inform an international benchmarking process for the development of K-6 mathematics standards in the U.S. First, the composite standards concentrate the early learning of mathematics on the number, measurement, and geometry strands with less emphasis on data analysis and little exposure to algebra. The Hong Kong standards for grades 1-3 devote approximately half the targeted time to numbers and almost all the time remaining to geometry and measurement.*

— Ginsburg, Leinwand and Decker, 2009

*Because the mathematics concepts in [U.S.] textbooks are often weak, the presentation becomes more mechanical than is ideal. We looked at both traditional and non-traditional textbooks used in the US and found this conceptual weakness in both.*

— Ginsburg et al., 2005

*There are many ways to organize curricula. The challenge, now rarely met, is to avoid those that distort mathematics and turn off students.*

— Steen, 2007

For over a decade, research studies of mathematics education in high-performing countries have pointed to the conclusion that the mathematics curriculum in the United States must become substantially more focused and coherent in order to improve mathematics achievement in this country. To deliver on the promise of common standards, the standards must address the problem of a curriculum that is "a mile wide and an inch deep." These Standards are a substantial answer to that challenge.

It is important to recognize that "fewer standards" are no substitute for focused standards. Achieving "fewer standards" would be easy to do by resorting to broad, general statements. Instead, these Standards aim for clarity and specificity.

Assessing the coherence of a set of standards is more difficult than assessing their focus. William Schmidt and Richard Houang (2002) have said that content standards and curricula are coherent if they are:

*articulated over time as a sequence of topics and performances that are logical and reflect, where appropriate, the sequential or hierarchical nature of the disciplinary content from which the subject matter derives. That is, what and how students are taught should reflect not only the topics that fall within a certain academic discipline, but also the key ideas that determine how knowledge is organized and generated within that discipline. This implies*



*that to be coherent, a set of content standards must evolve from particulars (e.g., the meaning and operations of whole numbers, including simple math facts and routine computational procedures associated with whole numbers and fractions) to deeper structures inherent in the discipline. These deeper structures then serve as a means for connecting the particulars (such as an understanding of the rational number system and its properties). (emphasis added)*

These Standards endeavor to follow such a design, not only by stressing conceptual understanding of key ideas, but also by continually returning to organizing principles such as place value or the properties of operations to structure those ideas.

In addition, the “sequence of topics and performances” that is outlined in a body of mathematics standards must also respect what is known about how students learn. As Confrey (2007) points out, developing “sequenced obstacles and challenges for students...absent the insights about meaning that derive from careful study of learning, would be unfortunate and unwise.” In recognition of this, the development of these Standards began with research-based learning progressions detailing what is known today about how students’ mathematical knowledge, skill, and understanding develop over time.

### **Understanding mathematics**

These Standards define what students should understand and be able to do in their study of mathematics. Asking a student to understand something means asking a teacher to assess whether the student has understood it. But what does mathematical understanding look like? One hallmark of mathematical understanding is the ability to justify, in a way appropriate to the student’s mathematical maturity, why a particular mathematical statement is true or where a mathematical rule comes from. There is a world of difference between a student who can summon a mnemonic device to expand a product such as  $(a + b)(x + y)$  and a student who can explain where the mnemonic comes from. The student who can explain the rule understands the mathematics, and may have a better chance to succeed at a less familiar task such as expanding  $(a + b + c)(x + y)$ . Mathematical understanding and procedural skill are equally important, and both are assessable using mathematical tasks of sufficient richness.

The Standards set grade-specific standards but do not define the intervention methods or materials necessary to support students who are well below or well above grade-level expectations. It is also beyond the scope of the Standards to define the full range of supports appropriate for English language learners and for students with special needs. At the same time, all students must have the opportunity to learn and meet the same high standards if they are to access the knowledge and skills necessary in their post-school lives. The Standards should be read as allowing for the widest possible range of students to participate fully from the outset, along with appropriate accommodations to ensure maximum participation of students with special education needs. For example, for students with disabilities reading should allow for use of Braille, screen reader technology, or other assistive devices, while writing should include the use of a scribe, computer, or speech-to-text technology. In a similar vein, speaking and listening should be interpreted broadly to include sign language. No set of grade-specific standards can fully reflect the great variety in abilities, needs, learning rates, and achievement levels of students in any given classroom. However, the Standards do provide clear signposts along the way to the goal of college and career readiness for all students.

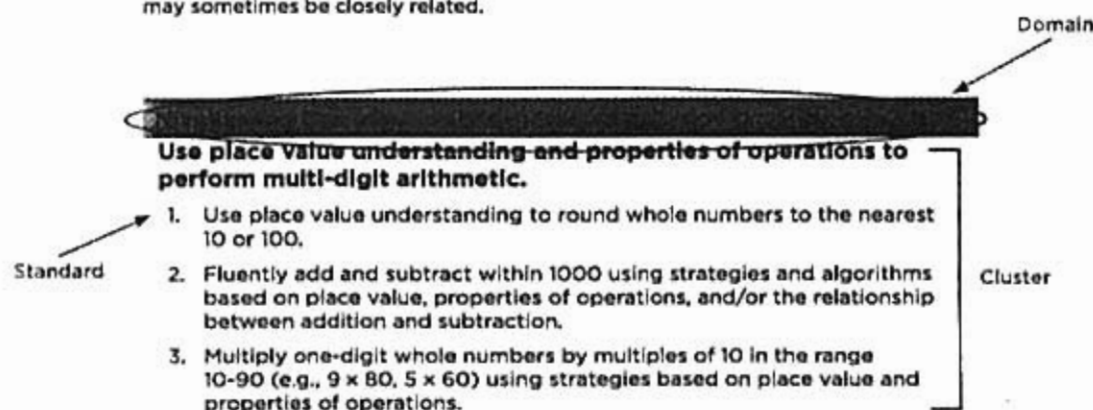
The Standards begin on page 6 with eight Standards for Mathematical Practice.

## How to read the grade level standards

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

Clusters are 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 ... should next come to learn ...." 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 standards are not just promises to our children, but promises we intend to keep.



# Mathematics | 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  $7 \times 8$  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  $2 \times 7$  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  $(x - 1)(x^3 + x^2 + x + 1)$  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.



## Grade 6 Overview

### Ratios and Proportional Relationships

- Understand ratio concepts and use ratio reasoning to solve problems.

### The Number System

- Apply and extend previous understandings of multiplication and division to divide fractions by fractions.
- Compute fluently with multi-digit numbers and find common factors and multiples.
- Apply and extend previous understandings of numbers to the system of rational numbers.

### Expressions and Equations

- Apply and extend previous understandings of arithmetic to algebraic expressions.
- Reason about and solve one-variable equations and inequalities.
- Represent and analyze quantitative relationships between dependent and independent variables.

### Geometry

- Solve real-world and mathematical problems involving area, surface area, and volume.

### Statistics and Probability

- Develop understanding of statistical variability.
- Summarize and describe distributions.

### Mathematical Practices

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.

## Grade 7 Overview

### Ratios and Proportional Relationships

- Analyze proportional relationships and use them to solve real-world and mathematical problems.

### The Number System

- Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers.

### Expressions and Equations

- Use properties of operations to generate equivalent expressions.
- Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

### Geometry

- Draw, construct and describe geometrical figures and describe the relationships between them.
- Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

### Statistics and Probability

- Use random sampling to draw inferences about a population.
- Draw informal comparative inferences about two populations.
- Investigate chance processes and develop, use, and evaluate probability models.

### Mathematical Practices

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.



## Grade 8 Overview

### The Number System

- Know that there are numbers that are not rational, and approximate them by rational numbers.

### Expressions and Equations

- Work with radicals and integer exponents.
- Understand the connections between proportional relationships, lines, and linear equations.
- Analyze and solve linear equations and pairs of simultaneous linear equations.

### Functions

- Define, evaluate, and compare functions.
- Use functions to model relationships between quantities.

### Geometry

- Understand congruence and similarity using physical models, transparencies, or geometry software.
- Understand and apply the Pythagorean Theorem.
- Solve real-world and mathematical problems involving volume of cylinders, cones and spheres.

### Statistics and Probability

- Investigate patterns of association in bivariate data.

### Mathematical Practices

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.

## Mathematics Standards for High School

The high school standards specify the mathematics that all students should study in order to be college and career ready. Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics is indicated by (+), as in this example:

(+) Represent complex numbers on the complex plane in rectangular and polar form (including real and imaginary numbers).

All standards without a (+) symbol should be in the common mathematics curriculum for all college and career ready students. Standards with a (+) symbol may also appear in courses intended for all students.

The high school standards are listed in conceptual categories:

- Number and Quantity
- Algebra
- Functions
- Modeling
- Geometry
- Statistics and Probability

Conceptual categories portray a coherent view of high school mathematics; a student's work with functions, for example, crosses a number of traditional course boundaries, potentially up through and including calculus.

Modeling is best interpreted not as a collection of isolated topics but in relation to other standards. Making mathematical models is a Standard for Mathematical Practice, and specific modeling standards appear throughout the high school standards indicated by a star symbol (\*). The star symbol sometimes appears on the heading for a group of standards; in that case, it should be understood to apply to all standards in that group.

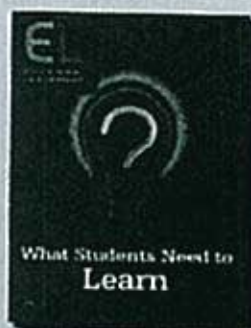


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**What Students Need to Learn** Pages 22-26

## The Humanities: Why Such a Hard Sell?

David J. Ferrero

In our efforts to help students achieve economic success, let's not ignore the personal and civic goals of schooling.



In fall 2009, interested television viewers could watch Harvard philosophy professor Michael Sandel deliver pithy lectures on Aristotle and Immanuel Kant and then pose tough moral questions, such as, Should we have the right to sell our organs on the free market? and Is it OK to kill one person to benefit thousands? These lectures were part of *Justice: What's the Right Thing to Do?*, a 12-part series examining competing theories of justice from ancient times to the present and their applications to contemporary ethical challenges. The series, which aired on Public Broadcasting Service (PBS) stations and is now available online at [www.justiceharvard.org](http://www.justiceharvard.org), was based on Sandel's popular freshman course on moral reasoning. It consisted entirely of Sandel's lectures and discussions with the 900 or so students enrolled in the course.

It would be difficult to imagine a more unlikely television series. But for an old humanities teacher like me, the mere fact that PBS would air it, and that sufficient funders could be found to underwrite it, was heartening. Here was a TV show focused on the relevance of the philosophical tradition and based on a college lecture course whose goal is to develop not engineers or entrepreneurs, but reflective citizens, wise leaders, and *good persons*. These aims garner little attention among those who are setting U.S. education priorities today.

## The Purposes of Schooling

Historically, democratic societies have recognized three broad purposes of schooling: personal, economic, and civic. At the *personal* level, schools have helped students discover and cultivate individual interests, talents, and tastes; form good habits; and develop an understanding of what it means to lead a good life. Schools have prepared students to contribute productively to the *economy* by preparing them to pursue a vocation or further study leading toward some profession. And schools have achieved *civic* goals by equipping students with the knowledge and skills necessary to be good citizens. Together these three imperatives have constituted a holistic understanding of persons as having private, productive, and civic selves.

That holism has atrophied. The civic purpose of schools, when invoked at all, is usually an afterthought, treated largely as a by-product of the economic imperative to develop 21st century skills said to be essential to the modern workforce. The personal dimension of schooling has been reduced to self-expression and self-advancement, wherein a school's value is defined primarily by whether it helps students earn credentials that will make them employable.



Both the civic and personal purposes of schooling, in other words, have been subsumed by the economic. Education reform today is all about credentials and competitiveness. And so has vanished a centuries-old tradition of educational aspiration, one known as *paideia*, *bildung*, or *humanitas*: the forging of good persons through a broad, humanistic liberal arts education. With it has gone any interest in those aspects of curriculum that cannot justify themselves in economic or credentialist terms.

The economic imperative does allow for a more well-rounded curriculum than it might seem at first glance. Math and science are no-brainers, of course, as are social sciences such as sociology, psychology, and economics. Physical education supports good health and long life, adding to productivity and reducing the costs of health care while honing that competitive edge. The arts fare surprisingly well, too, because they're hands-on, often involve working in groups, and help cultivate creativity, all of which rank high on lists of 21st century workforce skills. English and language arts also provide some clear cash value insofar as they help students develop strong communication skills.

But what about history? This requires some shoehorning. Some have argued that a global economy requires more knowledge of world cultures, and therefore of world history. But how deep a knowledge of the history of China does one really need to do business there? And how in workforce terms does one justify teaching the history of the Ottoman Empire, Carolingian Renaissance, or even American Revolution? History certainly has an economic component—the role of trade, competition for resources, and technology in shaping cultures over time. But what of the role of religion? Or art? Or political philosophy? Or literature? To justify the study of history, or indeed any of the humanities, in economic or workforce terms cuts out enormous swathes of human experience and accomplishment or distorts their meaning and value.

## Learning from the Humanities

Has the study of history, literature, art, and ideas—what we commonly call the humanities—outlived its relevance? I hope not. I believe students can still learn from the humanities and that these lessons can enhance their lives—and our collective life—in a variety of ways.

For one thing, a culture that celebrates consumer choice might want to ensure that young people have access to a full array of ways of using leisure beyond those that provide the most immediate appeal, instant gratification, and producer profit. People who have a broad exposure to a full range of arts and letters can graze the full range of entertainments, heading off to see a play after a day at the ballpark; indulging in the antics of Rabelais alongside those of Russell Brand; filling their iPods with Bach, Basie, and Beyoncé.

Further, because such people usually owe much of their exposure to the humanities to teachers and professors, they also have some grasp of the formal elements, historical evolution, and standards of excellence that define different humanistic and creative domains and connect contemporary popular forms with their "classic" forebears. Such knowledge helps them get more out of more popular entertainments, applying the same kind of acuity to their Monday morning musings over *Mad Men* as they do to their Wednesday night book club discussions of *Wuthering Heights*. (This runs against the common assumption that those who appreciate opera, fine wine,



and abstract art turn up their nose at popular entertainments. Those who haven't been exposed to a variety of entertainments often do plenty of snubbing, mocking opera, wine, and anything that smacks of the hoity-toity.)

A second reason to teach the humanities is that the humanities teach us about human achievement. A culture that prizes excellence might ask schools to provide exemplars who seek excellence across the full range of human endeavor. The study of history introduces us to the *people* whose lifelong pursuit of ideals, questions, or power led them to accomplish extraordinary things of consequence to others (and not always for the better, which is instructive). Pericles, Charlemagne, and Elizabeth I; Copernicus, Galileo, and Newton; Plato, Spinoza, and Nietzsche; Buddha, Jesus, Muhammed; Dante, Shakespeare, and Austen; Raphael, Velasquez, and Cassatt; and yes, Edison, Ford, and Gates were all driven to excel in an important domain of human endeavor. Understanding them and their pursuits opens us up to a fuller range of ways to both improve the world and find our place in it.

Third, and perhaps most important, those who believe in democracy and its elevation of the individual might ask schools to help students cultivate both a citizen identity and genuine autonomy. Here I'm talking about an aspect of humanistic learning that has been so thoroughly forgotten that people hardly bother to express disdain for it anymore: *tradition*. Yet the more I learn, the more I am convinced that immersion in traditions of thought and culture serves the important though seemingly contradictory ends of forging a collective public identity while enabling more autonomous thought and informed action among individuals.

Linking tradition to a shared identity is the easy part. Studying the history of the society or civilization to which we belong helps us situate ourselves in a story bigger than ourselves, recognize our inheritance, and deepen our identification with those who share that inheritance. The fierceness of the culture wars in the 1980s and 1990s reflected recognition of this, which is why they became virtually synonymous with identity politics. Lost in these arguments was any notion of a shared citizen identity—whether national or global—that could foster civil discourse and encourage common projects. I daresay that the quality of our current political discourse reflects that loss.

The role tradition plays in shaping autonomous thought is less easy to grasp, but it is dangerously underappreciated in a society that places so much importance on individual agency. We can start developing our own appreciation of tradition's role with the simple recognition that our present is shaped by the past. Pretending otherwise only strengthens the past's grip on us by rendering its influences invisible.

Consider: When historians trace a genealogy of formal thought about government from ancient Greece and Rome to 15th-century Florence, and another from Germanic tribal governance and Magna Carta to British liberalism, and note their confluence in Enlightenment innovations that later give way to romanticism, then to modernism, and a host of other political isms, they aren't just making up the connections. The debts to past thinkers were generally acknowledged by each innovating generation (often through explicit challenge or rejection). These arguments over time underlie much of what people in the present-day Western world consider "common sense." Western ideas about democracy, civil and human rights, free markets, individual autonomy, and



so on all emerged out of this tradition. Knowing the roots and evolution of prevailing ideas and values, as well as those they supplanted, enables people to embrace (and question) them with greater self-awareness. Such knowledge also provides an important context for interpreting current events and enables people to look more sympathetically and critically to *other* traditions for insight and inspiration.

The relevance of the humanities rests on a broader understanding of *humanism*, an orientation toward teaching and learning that goes beyond workforce competency and credentialing to encompass personal and civic dimensions of life. If educators take seriously the ideal of the whole child, we'll need to work to preserve and perpetuate that humanistic spirit. Just don't expect a lot of policy support for it.

## Finding a Space for the Humanities

I don't know whether the audience sympathetic to humanistic aims of schooling numbers in the thousands or dozens, but I'm confident that it's neither large nor influential enough to convince Intel that its engineers need to read Homer or to persuade the U.S. Congress that widespread familiarity with Baroque music will boost productivity. And it's quixotic to expect them to care about the intangible, hard-to-quantify benefits of discussing, writing about, and grappling with such stuff. Fortunately, current U.S. policy trends provide some space for practitioners to pursue the humanities while serving the policymakers' goals of competitiveness and credentials.

The Common Core State Standards, released in 2010 and adopted by 42 states by that year's end, were developed out of a preoccupation with competitiveness and credentials. But a careful reading of the standards for the English language arts suggests that the architects consciously designed them to allow for legitimate diversity of aims and breadth of content. See, for example, this note on reading content:

To become college and career ready, students must grapple with works of exceptional craft and thought whose range extends across genres, cultures, and centuries. Such works offer profound insights into the human condition and serve as models for students' own thinking and writing. Along with high-quality contemporary works, these texts should be chosen from among seminal U.S. documents, the classics of American literature, and the timeless dramas of Shakespeare. Through wide and deep reading of literature and literary nonfiction of steadily increasing sophistication, students gain a reservoir of literary and cultural knowledge, references, and images; the ability to evaluate intricate arguments; and the capacity to surmount the challenges posed by complex texts.<sup>1</sup>

This statement unequivocally endorses a *raison d'être* for K–12 other than work training and creates space for the humanities. The architects of the standards wisely defer to others to work out the details.

One such tool for working out these details is the set of curriculum maps developed by the coincidentally named Common Core, a nonprofit organization established in 2007 that is unrelated to the Common Core State Standards project. (See the article by Lynne Munson on p. 10 of this issue of *Educational Leadership* for more on Common Core.)



Working in collaboration with teachers and content experts, Common Core the *organization* uses Common Core *standards* to create curricular units—six per grade for grades K–12—that tie rich humanities content to the standards. The online resources at [www.commoncore.org/maps](http://www.commoncore.org/maps) include outlines, pacing guides, sample assessments, recommended works and artifacts, and other resources. The site includes a 5th grade unit called Clues to a Culture, which "focuses on clues to Native American nations/ cultures as revealed through pairings of literature and informational text," and one for 11th grade called American Romanticism, which examines "the emerging movement of American Romanticism in the early 19th century and the period leading up to the Civil War." Though incomplete as a curriculum package, the project demonstrates how standards motivated by credentials and careers can anchor humanistic aims.

Secondary educators who have already developed their own content and need to align it to the Common Core State Standards will soon be able to turn to the Literacy Design Collaborative resources for English language arts, social studies, and science for grades 6–12. The toolkit, expected to become available later in 2011 or in 2012, includes content-neutral formative assessment templates teachers can use to help students progress through reading and writing assignments that grow more demanding in terms of text complexity and expectations for thinking and writing. The templates include rubrics to help teachers gauge both the level of difficulty of an assignment and the results of the student's work.

When complete, the suite of resources will include a growing online library of free teacher-developed instructional modules similar to those developed by Common Core the organization and, eventually, model courses pegged to the Common Core State Standards. For now, the flexibility of the templates regarding choice of content and the focus on getting students to think rigorously, argue cogently, and write fluently represent another way the competitiveness and credentials agenda can serve the broader aspirations of the humanist educator.

## A Few Good Models

Long before the Common Core State Standards existed, other educators had already developed ways to marry competitiveness and humanism. Two quite different secondary school models do this particularly well. As a STEM (Science, Technology, Engineering, Math)-themed 6–12 charter school, the Denver School of Science Technology in Denver, Colorado, aspires to create the next generation of entrepreneurs and high-tech innovators; and its curriculum places heavy emphasis on projects and internships. Yet the school's leaders and faculty take pains to characterize it as a liberal arts school with a STEM focus.

In Illinois and Wisconsin, meanwhile, high schools adopting the Aligned by Design program put civic humanist priorities first, aiming to create the next generation of *citizens* through curriculums that expose students to the deep histories and idea systems underlying contemporary issues and teaching them how to reason and argue about those ideas in speech and print.<sup>2</sup>

Both models rely on the ACT's Standards for College Readiness and accompanying tests to help teachers incorporate the skills students need to succeed in college, careers, and civic life. Denver School of Science Technology teachers embed the ACT standards in daily lessons and administer homemade, web-based mini-assessments at the end of each class period. These



inform both the next day's lessons and individualized student supports the teachers create. The Aligned by Design model relies less on frequent assessments and more on deep analysis of the standards and teacher collaboration in determining how to integrate them across all content domains. Both models have found that this obsessive attention to the skills embedded in the ACT standards serves both their college- and career-ready missions and their humanistic ones.

## Valuing the Devalued

In policy and reform circles today, the humanistic aims of education are undervalued, and their place in the K-12 or even college curriculum is by no means assured. But they are at least tolerated, and the policies and tools being developed to support credentials and competition can be used to strengthen the humanities curriculum. Educators can cultivate in practice the humanistic ideas about which policy is largely silent.

Students want and deserve the opportunity for material prosperity that the credentials and competitiveness agenda seeks to provide. But insofar as educators do speak about the aims and purposes of schooling, we should take care to speak forthrightly about the full range of benefits a broad basic education seeks to provide, both for students and society. Otherwise, these other, equally important aims may be lost to public consciousness altogether.

## Endnotes

<sup>1</sup> Common Core State Standards Initiative. (n.d.). *English Language Arts Standards*. Retrieved from the Common Core State Standards Initiative at [www.corestandards.org/the-standards/english-language-arts-standards/anchor-standards-6-12/college-and-career-readiness-anchor-standards-for-reading](http://www.corestandards.org/the-standards/english-language-arts-standards/anchor-standards-6-12/college-and-career-readiness-anchor-standards-for-reading)

<sup>2</sup> I wrote previously about this model in Ferrero, D. (2006). *Having it all*. *Educational Leadership*, 63(8), 8-14.

*Author's note:* Development of the Common Core Standards, the Common Core organization's modules, and the Literacy Design Collaborative resources are funded by the Bill & Melinda Gates Foundation, which is the organization I work for. These views expressed here, however, are my own and are in no way intended to represent those of the foundation.

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ATTACHMENT C

# BUILDING FULL-SERVICE SCHOOL



Figure 1.5. Service Matrix for a Real Full-Service School

Service	Description/Clientele	Location/Hours	Funding Sources
Adult Education	Basic education and remediation for adults 16+ Undergraduate and graduate coursework	Middle School, Monday and Thursday 5-8 P.M. College and enrichment classes by semester	<ul style="list-style-type: none"> <li>• Adult Learning Center</li> <li>• Community schools</li> <li>• Community college</li> <li>• State university</li> </ul>
Casework	Protective services, Project Vision Referrals for delinquency, foster care, developmental and economic services, alcohol/drug abuse, mental health counseling, home visits	Middle School, weekdays	<ul style="list-style-type: none"> <li>• State Dept. of Children and Families (DCF)</li> </ul>
Child Care	Free or reduced, subsidized child care for children 3 months to 12 years Some restrictions apply	Appointments taken for location convenient to parent	<ul style="list-style-type: none"> <li>• Children's Services</li> </ul>
Community Use of School Facilities	Civic and parent groups apply for permission Available to all, free	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• County School Board</li> </ul>
Economic Services	AFDC, Medicaid, food stamps: intake, screening, application, review Referrals to other community resources	Middle School, M-F, 8 A.M.-5 P.M. Appointments preferred; walk-ins accepted	<ul style="list-style-type: none"> <li>• DCF</li> </ul>
Educational Opportunity Center	Career options counseling and financial aid for students 19+	Community Center, Tuesdays 1-4 P.M.	<ul style="list-style-type: none"> <li>• Community college</li> </ul>
First Call for Help	Toll-free community resource information hotline	Available districtwide	<ul style="list-style-type: none"> <li>• Center for Community Mental Health</li> <li>• United Way</li> <li>• Retired senior volunteers</li> </ul>
Graduation Enhancement Program	Technology-based early intervention to promote student learning	Intermediate and Middle Schools	<ul style="list-style-type: none"> <li>• County School Board</li> </ul>
Health Services	RN and psychologist: prevention, early detection, early intervention, and community referrals Mobile health unit Emergency food and clothing Affordable health insurance for school-age children	Intermediate and Middle Schools, M-F, school hours	<ul style="list-style-type: none"> <li>• Supplemental School Health Grant: DCF and State Dept. of Education</li> <li>• Sacred Heart Hospital</li> <li>• Community resources</li> <li>• Healthy Kids Corp.</li> </ul>



Figure 1.5. Service Matrix for a Real Full-Service School (continued)

Service	Description/Clientele	Location/Hours	Funding Sources
Healthy Kids	Affordable health insurance for children ages 3-19	Available districtwide Enrollment by toll-free number	<ul style="list-style-type: none"> <li>• State legislature</li> <li>• Healthy Kids Corp.</li> <li>• County School Board</li> <li>• County commissioners</li> <li>• Blue Cross/Blue Shield Health Options</li> </ul>
Home Visitor High-Risk Infant Program	Home visits by social worker for at-risk infants Training in parenting skills, immunizations, etc.	South end of county	<ul style="list-style-type: none"> <li>• DCF</li> </ul>
Job Services	Employment services for job training and placement with computer access to regional job listings	Middle School, M-F, 8 A.M.-5 P.M.	<ul style="list-style-type: none"> <li>• DCF</li> <li>• Private Industry Council (PIC)</li> <li>• Job Training Partnership Act</li> </ul>
Juvenile Alternative Services Program (JASP)	Meaningful sanctions and services for certain juvenile offenders and their families, designed to divert from judicial processing and to reduce incidence of law violations	Intermediate and Middle Schools	<ul style="list-style-type: none"> <li>• DCF</li> </ul>
Latchkey	State-licensed after-school programs until 6 P.M. schooldays and some holidays Summer camp program, 7:30 A.M.-6:30 P.M.	Primary, Intermediate, and Middle Schools Campers picked up and returned to Intermediate School	<ul style="list-style-type: none"> <li>• Community schools</li> <li>• Parent tuition</li> <li>• Title XX funding for qualified families</li> </ul>
Mental Health Counseling	Counseling for students and families Exceptional student education specialist Full-time therapist for emotionally or severely emotionally handicapped	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• Center for Community Mental Health</li> <li>• Medicaid</li> <li>• Private insurance</li> </ul>
Parent Involvement Center	Educational and counseling materials available for checkout by parents for use with students at home	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• Project Vision</li> <li>• National Foundation for the Improvement of Education (NFIE)</li> <li>• Junior League</li> <li>• Community resources</li> <li>• Parent-teacher association (PTA)</li> <li>• Parent advisory boards</li> </ul>

(continued on next page)



Figure 1.5. Service Matrix for a Real Full-Service School (continued)

Service	Description/Clientele	Location/Hours	Funding Sources
Parent Workshops	Hosted periodically during the school year for all interested persons	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• Project Vision</li> <li>• Community resources</li> <li>• PTA</li> <li>• Parent advisory boards</li> </ul>
Prekindergarten	Head Start or early intervention programs for 4-year-olds Placement on space-available basis Some restrictions	Intermediate School	<ul style="list-style-type: none"> <li>• Federal and state funding in collaboration with County School Board</li> </ul>
Private Industry Council (PIC)	Employability skills for middle school, 16+ students, and adults	Middle School	<ul style="list-style-type: none"> <li>• PIC</li> </ul>
Protective Services	Onsite investigator for abuse or neglect complaints through State Protective Services System's Abuse Registry	Middle School	<ul style="list-style-type: none"> <li>• DCF</li> </ul>
Research	Ongoing research activity supervised by state university	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• Full-service schools</li> <li>• State university</li> </ul>
Sheriff's Department	Onsite deputy available for assistance with law enforcement issues, education, and prevention activities	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• County Sheriff's Department</li> <li>• Full-service schools</li> </ul>
Volunteers	Volunteers act as tutors, teacher helpers, mentors, etc.	Primary, Intermediate, and Middle Schools	<ul style="list-style-type: none"> <li>• Retired senior volunteers</li> <li>• County School Board</li> <li>• Community organizations</li> </ul>
Women, Infants, and Children Program	Offers nutrition counseling and supplemental food for prenatal and postnatal care and for children from birth to 5 years	Community Center, 1st Wednesday and 2nd Friday each month, 9 A.M.–3 P.M.	<ul style="list-style-type: none"> <li>• PIC</li> <li>• Federal funding through County Public Health Unit</li> </ul>

See Resource A for template listing suggested services.