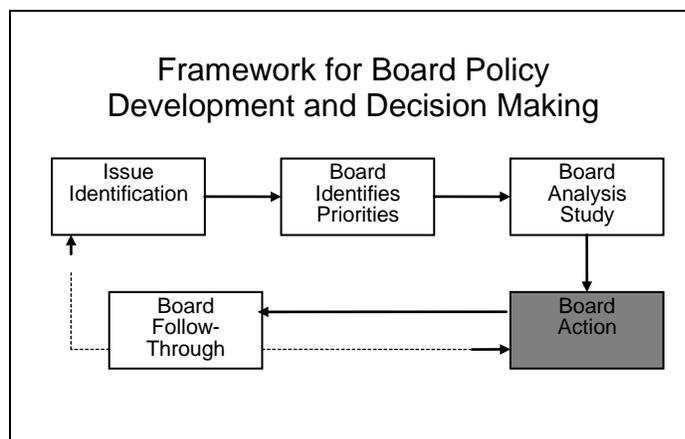


# Iowa State Board of Education

## Executive Summary

November 17, 2010



- Agenda Item:** Additions to the Common Core Standards
- Iowa Goal:** All K-12 students will achieve at a high level.
- Equity Impact Statement:** The Iowa Core and Common Standards are designed to help all students achieve at a high level.
- Presenter:** Rita Martens, Lead Consultant  
Bureau of Teaching and Learning Services
- Judith Spitzli, Consultant  
Bureau of Teaching and Learning Services
- Attachments:** 2
- Recommendation:** It is recommended that the State Board adopt the additions to the Common Core Standards in K-12 English language arts and mathematics.
- Background:** The State Board adopted the Common Core Standards in K-12 English language arts and mathematics July 29, 2010. Since that time, Department consultants have engaged content experts across the state in defining the critical content of the Iowa Core essential concepts and skills in mathematics and literacy which was not addressed by the Common Core Standards. This critical missing content is articulated in the additions to the Common Core that the State Board is now being asked to adopt.
- This content was identified through a multi-step alignment process and has been vetted by the following groups:
- the original K-8 and 9-12 Iowa Core work teams in literacy and mathematics.
  - newly formed leadership teams in literacy and mathematics, representing content area leadership from higher education, area education agencies, local districts, and other supporting organizations.
  - the Iowa Core Project Lead Team.

## **Additions to the Common Core State Standards for English Language Arts**

In July, the State Board of Education adopted the Common Core State Standards in English language arts and mathematics. States are allowed to add 15 percent of their own standards to the Common Core State Standards. The content chosen to include in the additional 15 percent is essential content in the Iowa Core that goes beyond the Common Core recommendations.

In the Common Core Standards document, notes were included that provide guidance about the context for instruction. Because these instructional notes are so important to ensuring success in achieving these standards, we are including them here. In some of the instructional notes we have included additional language based on the Iowa Core. That additional language is highlighted in boldface. These notes will be included in the Iowa Core document for school districts.

On pages 3 and 4, additional standards for reading, speaking and listening, and an instructional note for literacy are also included.

Adopt all notes with boldfaced revisions:

- Note on range and content of student reading (K-5)  
*To build a foundation for college and career readiness, students must read widely and deeply from among a broad range of high-quality, increasingly challenging literary and informational texts. Through extensive reading of stories, dramas, poems, and myths **and exposure to visual media** from diverse cultures and different time periods, students gain literary and cultural knowledge as well as familiarity with various text structures and elements. By reading texts in history/social studies, science, and other disciplines, students build a foundation of knowledge in these fields that will also give them the background to be better readers in all content areas. Students can only gain this foundation when the curriculum is intentionally and coherently structured to develop rich content knowledge within and across grades. Students also acquire the habits of reading independently and closely, which are essential to their future success.*
- Note on range and content of student writing (K-5)  
*To build a foundation for college and career readiness, students need to use **writing as a tool for learning and communicating** to offer and support opinions, demonstrate understanding of the subjects they are studying, and convey real and imagined experiences and events. They learn to appreciate that a key purpose of writing is to communicate clearly to an external, sometimes unfamiliar audience, and they begin to adapt the form and content of their writing to accomplish a particular task and purpose. They develop the capacity to build knowledge on a subject through research projects and to respond analytically to literary and informational sources. To meet these goals, students must devote significant time and effort to writing, producing numerous pieces over short and extended time frames throughout the year.*

- Note on range and student content of student speaking and listening (K-5)  
*To build a foundation for college and career readiness, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner. Being productive members of these conversations requires that students contribute accurate, relevant information; respond to and develop what others have said; make comparisons and contrasts; and analyze and synthesize a multitude of ideas in various domains.*  
*New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. Digital texts confront students with the potential for continually updated content and dynamically changing combinations of words, graphics, images, hyperlinks, and embedded video and audio.*
- Note on range and content of student language use (K-5)  
*To build a foundation for college and career readiness in language, students must gain control over many conventions of standard English grammar, usage, and mechanics as well as learn other ways to use language to convey meaning effectively. They must also be able to determine or clarify the meaning of grade-appropriate words encountered through listening, reading, and media use; come to appreciate that words have nonliteral meanings, shadings of meaning, and relationships to other words; and expand their vocabulary in the course of studying content. The inclusion of Language standards in their own strand should not be taken as an indication that skills related to conventions, effective language use, and vocabulary are unimportant to reading, writing, speaking, and listening; indeed, they are inseparable from such contexts.*
- Note on range and content of student reading (6-12 Literacy)  
*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 **and thoughtful exposure to visual media** 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.*
- Note on range and content of student writing (6-12 Literacy)  
*For students, writing is a key means of asserting and defending claims, showing what they know about a subject, and conveying what they have experienced, imagined, thought, and felt. To be college- and career ready writers, students must take task, purpose, and audience into careful consideration, choosing words, information, structures, and formats deliberately. They need to know how to combine elements of different kinds of writing—for example, to use narrative strategies within argument and*

*explanation within narrative—to produce complex and nuanced writing. They need to be able to use technology strategically when creating, refining, and collaborating on writing **and visual media**. They have to become adept at gathering information, evaluating sources, and citing material accurately, reporting findings from their research and analysis of sources in a clear and cogent manner. They must have the flexibility, concentration, and fluency to produce high-quality first draft text under a tight deadline as well as the capacity to revisit and make improvements to a piece of writing over multiple drafts when circumstances encourage or require it.*

- Note on range and content of student speaking and listening (6-12 Literacy)  
*To become college and career ready, students must have ample opportunities to take part in a variety of rich, structured conversations—as part of a whole class, in small groups, and with a partner—built around important content in various domains. They must be able to contribute appropriately to these conversations, to make comparisons and contrasts, and to analyze and synthesize a multitude of ideas in accordance with the standards of evidence appropriate to a particular discipline. Whatever their intended major or profession, high school graduates will depend heavily on their ability to listen attentively to others so that they are able to build on others’ meritorious ideas while expressing their own clearly and persuasively. New technologies have broadened and expanded the role that speaking and listening play in acquiring and sharing knowledge and have tightened their link to other forms of communication. The Internet has accelerated the speed at which connections between speaking, listening, reading, and writing can be made, requiring that students be ready to use these modalities nearly simultaneously. Technology itself is changing quickly, creating a new urgency for students to be adaptable in response to change.*
- Note on range and content of student language use (6-12 Literacy)  
*To be college and career ready in language, students must have firm control over the conventions of standard English. At the same time, they must come to appreciate that language is as at least as much a matter of craft as of rules and be able to choose words, syntax, and punctuation to express themselves and achieve particular functions and rhetorical effects. They must also have extensive vocabularies, built through reading and study, enabling them to comprehend complex texts and engage in purposeful writing about and conversations around content. They need to become skilled in determining or clarifying the meaning of words and phrases they encounter, choosing flexibly from an array of strategies to aid them. They must learn to see an individual word as part of a network of other words—words, for example, that have similar denotations but different connotations. The inclusion of Language standards in their own strand should not be taken as an indication that skills related to conventions, effective language use, and vocabulary are unimportant to reading, writing, speaking, and listening; indeed, they are inseparable from such contexts.*

Add the following standards for Reading:

- Add under Key Ideas and Details at grades K, 1, 2, 3, 4, 5, 6, 7, 8, 9-10, 11-12:

***IA. 1. Employ the full range of research-based comprehension strategies, including making connections, determining importance, questioning, visualizing, making inferences, summarizing, and monitoring for comprehension.***

- Add under Key Ideas and Details at grades 6, 7, 8, 9-10, 11-12:  
***IA.2. Read on-level text, both silently and orally, at an appropriate rate with accuracy and fluency to support comprehension.***

Add the following standards for Speaking and Listening

- Add under Presentation of Knowledge and Ideas grades K, 1, and 2  
***IA.1. Recite familiar stories, poems, nursery rhymes, and lines of a play.***
- Add under Presentation of Knowledge and Ideas grades 3, 4, and 5.  
***IA.1 Perform dramatic readings and presentations.***
- Add under Presentation of Knowledge and Ideas grades 6, 7, 8, 9-10 and 11-12.  
***IA.1. Prepare and conduct interviews.***  
***IA.2. Participate in public performances.***
- Add under Presentation of Knowledge and Ideas grades 9-10 and 11-12  
***IA.3 Debate an issue from either side.***

For Literacy in History/Social Studies, Science, and Technical Subjects Grades 6-12

- Extend to include grades K-5
- Add the following note:  
***IA*** ***Content area literacy is critical to students' post secondary success in higher education and the workplace. To prepare students for these challenges, literacy skills must be developed across all content areas. Students expand their range when applying literacy skills to a variety of content areas because the academic discourses and disciplinary concepts in those require different approaches to reading, writing, speaking, viewing, and listening. It is through applying literacy skills in a number of content areas that students learn to integrate these skills and strategies into life experience. Teachers in all content areas who make literacy a priority understand that learning involves making meaning.***

***Although the authors of the Common Core Standards chose to articulate standards for literacy in the areas of history/social studies, science, and technical subjects, the Iowa Core extends that definition to include all secondary content areas.***

## **Additions to Common Core Standards for Mathematics**

The Iowa Core recommends a broader set of concepts and skills needed to prepare all students for success in both college and the workplace in the 21st century. The content chosen to include in the additional 15% is essential content in the Iowa Core that goes above and beyond the Common Core recommendations. Additional content is recommended for Mathematical Practices Standards K-12 and Mathematical Content Standards in Grade 2 and Grades 9-12.

### **1. Standards for Mathematical Practices K-12**

- Insert the following paragraph at the end of Mathematical Practice Standard #7 in the Common Core: “Look For and Make Use of Structure”

Students who look for patterns in their environment expect things to make sense and develop a habit of finding relationships and making predictions. Students should investigate patterns in number, shape, data, change, and chance. They should be given opportunities to learn how to represent those patterns numerically, geometrically and/or algebraically.

### **2. Grade 2**

- Insert the following Iowa Core standard on time and money in the “Measurement and Data” domain in the “Work with Time and Money” cluster between standards 7 and 8.

**IA.1** Describe the relationship among standard units of time: minutes, hours days, weeks, months and years.

- Insert the following Iowa Core standard on data analysis in the “Measurement and Data” domain in the “Represent and Interpret Data” cluster between standards 9 and 10.

**IA.2** Use interviews, surveys, and observations to collect data that answer questions about students’ interests and/or their environment.

### **3. Grades 9-12**

Additions are made in the following four areas. Details are given below.

- A. Plotting points in three dimensions
- B. Vertex-edge graphs (networks)
- C. Mathematics of voting
- D. Mathematics of the Internet

#### **A. Plotting Points in Three Dimensions**

- Insert the following Iowa Core standard in the 9-12 Geometry conceptual category of Common Core, in the “Geometric Measurement and Dimension” domain, at the

beginning of “Visualize Relationships between Two- and Three-Dimensional Objects” cluster.

**IA.3** Plot points in three-dimensions.

## **B. Vertex-Edge Graphs**

- Insert the following Iowa Core standards in the 9-12 Geometry conceptual category of Common Core as a new cluster at the end of the “Modeling with Geometry” domain. Insert the designated text in the Glossary.

New Cluster Title:

**Use diagrams consisting of vertices and edges (vertex-edge graphs) to model and solve problems related to networks.**

New Standards for the New Cluster:

- **IA.4** (\*) Understand, analyze, evaluate, and apply vertex-edge graphs to model and solve problems related to paths, circuits, networks, and relationships among a finite number of elements, in real-world and abstract settings.
- **IA.5** (\*) Model and solve problems using at least two of the following fundamental graph topics and models: Euler paths and circuits, Hamilton paths and circuits, the traveling salesman problem (TSP), minimum spanning trees, critical paths, vertex coloring.
- **IA.6** (\*) Compare and contrast vertex-edge graph topics and models in terms of:
  - properties
  - algorithms
  - optimization
  - types of problems that can be solved

Glossary Entry:

Vertex-Edge Graphs (IA). Vertex-edge graphs are diagrams consisting of vertices (points) and edges (line segments or arcs) connecting some of the vertices. Vertex-edge graphs are also sometimes called networks, discrete graphs, or finite graphs. A vertex-edge graph shows relationships and connections among objects, such as in a road network, a telecommunications network, or a family tree. Within the context of school geometry, which is fundamentally the study of shape, vertex-edge graphs represent, in a sense, the situation of no shape. That is, vertex-edge graphs are geometric models consisting of vertices and edges in which shape is not essential, only the connections among vertices are essential. These graphs are widely used in business and industry to solve problems about networks, paths, and relationships among a finite number of objects – such as, analyzing a computer network; optimizing the route used for snowplowing, collecting garbage, or visiting business clients; scheduling committee meetings to avoid conflicts; or planning a large construction project to finish on time.

## **C. Mathematics of Voting**

- Insert the following Iowa Core standard in the 9-12 Number and Quantity conceptual category of Common Core Mathematics as a new cluster at the end of the “Quantities” domain. Insert the designated text in the Glossary.

New Cluster Title:

**Understand and apply the mathematics of voting.**

New Standard for the New Cluster:

- **IA.7** Understand, analyze, apply, and evaluate some common voting and analysis methods in addition to majority and plurality, such as runoff, approval, the so-called instant-runoff voting (IRV) method, the Borda method and the Condorcet method.

Glossary Entry:

Mathematics of Voting (IA). The instant-runoff voting (IRV), the Borda method (assigning points for preferences), and the Condorcet method (in which each pair of candidates is run off head to head) are all forms of preferential voting (rank according to your preferences, rather than just voting for your single favorite candidate).

**D. Mathematics of the Internet**

- Insert the following Iowa Core standards in the 9-12 Number and Quantity conceptual category of Common Core as a new cluster at the end of the “Quantities” domain. Insert the designated text in the Glossary. All of these new standards are to be added in the “+” category. The “+” category is defined in the Common Core as, “Additional mathematics that students should learn in order to take advanced courses such as calculus, advanced statistics, or discrete mathematics. Standards with a (+) symbol may appear in courses intended for all students.”

New Cluster Title:

**Understand and apply some basic mathematics of information processing and the Internet.**

New Standards for the New Cluster:

- **IA.8 (+)** Describe the role of mathematics in information processing, particularly with respect to the Internet.
- **IA.9 (+)** Understand and apply elementary set theory and logic as used in simple Internet searches.
- **IA.10 (+)** Understand and apply basic number theory, including modular arithmetic, for example, as used in keeping information secure through public-key cryptography.

Glossary Entry:

Mathematics of Information Processing and the Internet (IA). The Internet is everywhere in modern life. To be informed consumers and citizens in the information-dense modern world

permeated by the Internet, students should have a basic mathematical understanding of some of the issues of information processing on the Internet. For example, when making an online purchase, mathematics is used to help you find what you want, encrypt your credit card number so that you can safely buy it, send your order accurately to the vendor, and, if your order is immediately downloaded, as when purchasing software, music, or video, ensure that your download occurs quickly and error-free. Essential topics related to these aspects of information processing are basic set theory, logic, and modular arithmetic. These topics are not only fundamental to information processing on the Internet, but they are also important mathematical topics in their own right with applications in many other areas.