Iowa Core Introduction to Mathematics 9-12 Transcript

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The topic of our webcast is Iowa Core Mathematics grades 9-12. My name is Judith Spitzli and I am a Mathematics Consultant at the Iowa Department of Education. This is an introduction to the new Iowa Core Mathematics after the adoption of the Common Core for Mathematics by the State Board of Education. This webcast is the second in a planned series that will address Iowa Core Mathematics.

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Our learning goals are that participants will understand the structure of the new Iowa Core Mathematics document in grades 9-12 and also understand the terminology used in the document.

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The first topic is the structure of the mathematics document. The document has two sets of standards identified for 9-12 mathematics. The first set of standards is the Standards for Mathematical Practice, and the second set is Standards for Mathematical Content.

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The Standards for Mathematical Practice describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

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There are eight Mathematics Practices.
The practices include:

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, and
8. Look for and express regularity in repeated reasoning.

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Next, we will address the Standards for Mathematical Content. The high school standards specify the mathematics that all students should study in order to be college and career ready.

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The mathematics standards for grades 9-12 are listed in conceptual categories.

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The format for grades 9-12 is conceptual category, then domain, cluster and finally standard.

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Conceptual categories are the big ideas that connect mathematics across high school, such as functions, and probability and statistics.

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Domains are large groups of related standards. Standards from different domains may sometimes be closely related.

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The next level of the format is cluster. These are groups of related standards. Standards from different clusters may sometimes be closely related, because mathematics is a connected subject. Clusters appear inside domains.

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The final level is the standard. Standards define what students should be able to understand and be able to do. Standards are part of a cluster.

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The mathematical standards for high school include the following conceptual categories: Number and Quantity, Algebra, Functions, Modeling, Geometry and Statistics and Probability.

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Now, let's look at an example from the Number and Quantity conceptual category. Notice that the Domain is The Real Number System. The cluster title is Extend the properties of exponents to rational exponents and this cluster has two standards.

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There are two important symbols in the 9-12 portion of the mathematics document. The (+) symbol indicates additional mathematics that students should learn in order to take advanced courses. The (+) standards are not required for all students. The (*) symbol indicates a modeling standard. This symbol will appear at the end of an individual standard or the star symbol may appear on the heading for a group of standards, a cluster; in that case, it should be understood to apply to all standards in the cluster.

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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 section of the document. Modeling is also one of the high school conceptual categories.

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Each state was allowed to add up to 15% in additional content to the Common Core. Eight additional standards were added in Mathematics 9-12 and one paragraph was added to Mathematical Practice #7 “Look for and make use of structure.”

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In order for readers to identify which content was added to the document, the following format was used. There is a capital IA in front of each of the added standards. There are eight additional standards in the 9-12 portion of Iowa Core Mathematics.

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The eight additional content standards are located in the following clusters: Understand and apply the mathematics of voting, Understand and apply some basic mathematics of information processing and the Internet.

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Visualize relationships between two-dimensional and three-dimensional objects and Use diagrams consisting of vertices and edges (vertex-edge graphs) to model and solve problems related to networks.

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A frequently asked question when people are studying the high school mathematics document is whether the italics sections are optional. The answer is no. An example of this is located in a cluster entitled Prove geometric theorems. The standard number 9 states: prove theorems about lines and angles. Then the italic portion explains what theorems the students should prove.

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This concludes the K-8 Iowa Core Mathematics webcast. If you have questions or concerns, please contact me. Thank you for taking the time to listen to this webcast.