

Albuquerque Public Schools
Common Core State Standards – High School Mathematics
Introduction to the Units of Study

The Common Core State Standards (CCSS) for Mathematics are designed on research-based learning progressions detailing what is known to day about how students’ mathematical knowledge, skill, and understanding develop over time. The standards define what students should understand and be able to do in their study of mathematics. “Mathematical understanding and procedural skill are equally important, and both are assessable using mathematical tasks of sufficient richness. (Common Core State Standards for Mathematics, Introduction section, pg. 4, ¶13)

The CCSS for Mathematics are comprised of and the standards for mathematical practice (SMP) and the grade level standards. The SMP describe the varieties of expertise that should be developed in all students. They are based on processes and proficiencies that apply across grades K-12, with increasing engagement with the subject matter as students reach mathematical maturity and expertise.

Standards for Mathematical Practice
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 patterns
8. Look for and express regularity in repeated reasoning.

(Read the SMP in full in the CCSS Standards for Mathematics, pp. 6-8.)

The grade level standards are grouped into domains and clusters. The domains are large groups of related standards that connect topics and content between and among conceptual categories. Cluster headings serve as an overview and quick summary of the mathematical ideas within a domain. They also illustrate the progression of mathematical ideas. Standards describe what students should know and be able to do for that cluster heading, domain, and conceptual category.

At the end of each Unit of Study, an assessment will be provided that aligns to the CCSS addressed in the unit. This assessment will be a Performance Based Task that will focus on “applying skills, concepts, and understanding to solve multi-step problems requiring abstract reasoning, precision, perseverance, and strategic use of tools.” For more information about

sample tasks, visit the PARCC website:
<http://www.parcconline.org/samples/item-task-prototypes> .

Students in grades 3-11 will complete both “short and extended response questions focused on conceptual knowledge and skills” on the Performance Based Assessment of the PARCC exam in the Spring of 2015. Incorporating these performance tasks into classroom learning now will ensure that students are exposed to these types of tasks. Additionally, teachers will be able to provide feedback to students based on their performance on these tasks.

The units of study are living documents that teachers will continue to reflect upon throughout the implementation of the Common Core State Standards. Best practice for implementing the units centers around collaborative professional conversations. These may take place in grade level, department, or Professional Learning Community settings.

The chart below represents the grade level domains to be taught in grades K-8.

Domains	K	1	2	3	4	5	6	7	8
Counting & Cardinality	•								
Operations & Algebraic Thinking	•	•	•	•	•	•			
Number & Operations in Base 10	•	•	•	•	•	•			
Measurement & Data	•	•	•	•	•	•			
Geometry	•	•	•	•	•	•	•	•	•
Number & Operations–Fractions				•	•	•			
Ratios & Proportional Relationships							•	•	
Number System							•	•	•
Expressions & Equations							•	•	•
Statistics & Probability							•	•	•
Functions									•

The standards selected for Geometry Units of Study are taken from the geometry content standards and the SMP. Standards selected for Algebra I and Algebra II are taken from the algebra, statistics and probability, number and quantity, and function content standards as well as the SMP. To determine which standards were assigned to Algebra I and Algebra II, the writers referenced the PARCC Model Content Framework, version 3.0. (November 2012).

The chart below represents the domains and clusters to be taught in Algebra I, Geometry, and Algebra II.

	Algebra I	Geometry	Algebra II
Number and Quantity			
The Real Number System	•		•
Quantities	•		•
The Complex Number System			•
Vector and Matrix Quantities (+)			
Algebra			
Seeing Structure in Expressions	•		•
Arithmetic with Polynomials and Rational Expressions	•		•
Creating Equations	•		•
Reasoning with Equations and Inequalities	•		•
Functions			
Interpreting Functions	•		•
Building Functions	•		•
Linear, Quadratic, and Exponential Models	•		•
Trigonometric Functions			•
Geometry			
Congruence		•	
Similarity, Right Triangles, and Trigonometry		•	
Circles		•	
Expressing Geometric Properties with Equations		•	•
Geometric Measurement and Dimension		•	
Modeling with Geometry		•	
Statistics and Probability			
Interpreting Categorical and Quantitative Data	•		•
Making Inferences and Justifying Conclusions			•
Conditional Probability and the Rules of Probability			•
Using Probability to Make Decisions (+)			
Modeling			

(+) Indicates standards for students taking advanced courses, such as calculus, advanced statistics, or discrete mathematics.

The graphic in the following page outlines the sections of the unit of study.

High School	Units of Study (Grading Period) Course Title	Unit X
The header contains the title of the unit, grade level, unit number, semester, and number of instructional days to complete the unit and the performance task.		
Unit Overview		
The overview contains a narrative describing the major content and concepts students will encounter in the unit.		
Mathematical Practice Standards to Be Integrated		
Specific practices students will use in learning the content and responding to the Essential Questions.		
Content to be Learned		
The “unwrapped” version of the standard identifies what students must know and be able to do, highlighting the skills and knowledge for each focus standard in the unit.		
Essential Questions		
These standards-based questions are provided to students during instruction and for formative assessment. The questions are designed to be open-ended, require a constructed response, and leads students to conceptual understandings addressed in the performance task.		
Assessment		
The performance task is performance based, aligned to the standards, which help drive instruction using backward planning.		
Clusters and Instructional Notes	Common Core State Standards	
<p>The instructional notes are a critical attribute of the courses and should not be overlooked. They include considerations regarding constraints, extensions, and connections within the Unit of Study.</p> <p>It is important to note that the units (or critical areas) are intended to convey coherent groupings of content.</p> <p>Integrating the Standards for Mathematical Practice The Standards for Mathematical Practice should be embedded in classroom instruction, discussions, and activities. Carefully designed standards-based mathematical tasks will reveal students’ content knowledge and elicit evidence of mathematical practices.</p>	<p>This section identifies the content standards addressed in the unit of study. Any portion of the standard(s) not addressed is marked with a strike through to clarify the focus of the unit’s instruction. The standard is taught in its entirety in a later unit. To deliver instruction, teachers incorporate content material from core instructional materials, supplemental materials and other resources.</p> <p>PARCC Frameworks designate clusters as Major, Supporting, and Additional for the course in question. Some clusters that are not major emphases in themselves are designed to <i>support</i> and strengthen areas of major emphasis, while other clusters that may not connect tightly or explicitly to the major work of the grade would fairly be called <i>additional</i>.</p>	