NCTM Standards for Mathematics
Standards for Grades 9-12
Online Coursework Standards Alignment

VASTS Online Module Lessons

Number and Operations Standards	1	2	3	4	5	6	7	8	9	10
Instructional programs from grades 9 through grade 12 enable all students to-										
• Understand numbers, ways of representing numbers, relationships among numbers, and number systems	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Understand meanings of operations and how they relate to one another	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Compute fluently and make reasonable estimates	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Algebra Standard for Grades 9-12										
Instructional programs from grades 9 through grade 12 enable all students to-										
• Understand patterns, relations, and functions	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Represent and analyze mathematical situations and structures using algebraic symbols	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Use mathematical models to represent and understand quantitative relationships	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Analyze change in various contexts	☑				☑	☑				☑
Geometry Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Analyze characteristics and properties of two- and three- dimensional geometric shapes and develop mathematical arguments about geometric relationships	☑	☑					☑	☑	☑	☑
• Specify locations and describe spatial relationships using coordinate geometry and other representational systems						☑				☑
• Apply transformations and use symmetry to analyze mathematical situations										
• Use visualization, spatial reasoning, and geometric modeling to solve problems	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Measurement Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Understand measurable attributes of objects and the units, systems, and processes of measurement	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Apply appropriate techniques, tools, and formulas to determine measurements	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Data Analysis and Probability Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them				☑			☑			
• Select and use appropriate statistical methods to analyze data										
• Develop and evaluate inferences and predictions that are based on data										
• Understand and apply basic concepts of probability										
Problem Solving Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Build new mathematical knowledge through problem solving	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Solve problems that arise in mathematics and in other contexts	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Apply and adapt a variety of appropriate strategies to solve problems	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Monitor and reflect on the process of mathematical problem solving	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Reasoning and Proof Standard Grades 9-12										

Number and Operations Standards	1	2	3	4	5	6	7	8	9	10
Instructional programs from grades 9 through 12 enable all students to-										
• Recognize reasoning and proof as fundamental aspects of mathematics										
• Make and investigate mathematical conjectures										
• Develop and evaluate mathematical arguments and proofs										
• Select and use various types of reasoning and methods of proof										
Communication Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Organize and consolidate their mathematical thinking through communication	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Communicate their mathematical thinking coherently and clearly to peers, teachers, and others	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Analyze and evaluate the mathematical thinking and strategies of others										
• Use the language of mathematics to express mathematical ideas precisely	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Connections Standard for Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Recognize and use connections among mathematical ideas	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Understand how mathematical ideas interconnect and build on one another to produce a coherent whole	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Recognize and apply mathematics in contexts outside of mathematics	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
Representation Standard Grades 9-12										
Instructional programs from grades 9 through 12 enable all students to-										
• Create and use representations to organize, record, and communicate mathematical ideas	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Select, apply, and translate among mathematical representations to solve problems	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑
• Use representations to model and interpret physical, social, and mathematical phenomena	☑	☑	☑	☑	☑	☑	☑	☑	☑	☑