New Hampshire Department of Education
Serving New Hampshire's Education Community

NEW HAMPSHIRE Common Core State Standards-Aligned MATHEMATICS COMPETENCIES

CCSSM CATEGORY	CCSSM DOMAIN	CCSSM CLUSTERS (*Italicized text* indicates SBAC College & Career Readiness emphases)	Mathematics COMPETENCIES
NUMBERS AND QUANTITY	**The Real Number System & The Complex Number System**	• *Extend properties of exponents to rational exponents* • *Use properties of rational and irrational numbers* • Perform arithmetic operations with complex numbers • Use complex numbers in polynomial identities and equations	***1. Competency: Students will demonstrate the ability to use and extend properties of complex number systems (includes both real and imaginary numbers).***
	Quantities	• *Reason quantitatively and use units to solve problems*	***2. Competency: Students will demonstrate the ability to reason quantitatively when analyzing, representing, and solving problems.***
	Vector and Matrix Quantities	• Represent and model with vector quantities • Perform operations on vectors • Perform operations on matrices and use matrices in applications	***3. (+)[1] Competency: Students will demonstrate the ability to analyze and represent vector and matrix quantities in solving problems.***

[1] "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" (*Common Core State Standards for Mathematics*, p. 57).

CCSSM CATEGORY	CCSSM DOMAIN	CCSSM CLUSTERS (*Italicized text* indicates SBAC College & Career Readiness emphases)	Mathematics COMPETENCIES
ALGEBRA	Seeing Structures in Expressions	• *Interpret the structure of expressions* • *Write expressions in equivalent forms to solve problems*	***4. Competency: Students will demonstrate the ability to analyze and use structure in expressions to solve problems***
	Arithmetic with Polynomials and Rational Expressions & Use polynomial identities to solve problems	• *Perform arithmetic operations on polynomials* • Understand the relationship between zeros and factors of polynomials • Use polynomial identities to solve problems • Rewrite rational expressions	***5. Competency: Students will demonstrate the ability to solve problems when applying concepts of polynomials and concepts of rational expressions.***
	Creating Equations	• *Create equations that describe numbers or relationships*	***6. Competency: Students will demonstrate the ability to create and use algebraic models to connect mathematical concepts and properties when solving real-world problems.***
	Reasoning with Equations and Inequalities	• *Understand solving equations as a process of reasoning and explain the reasoning* • *Solve equations and inequalities in one variable* • *Represent and solve equations and inequalities graphically* • *Solve systems of equations*	***7. Competency: Students will demonstrate the ability to explain and justify reasoning when solving equations, inequalities, and systems of equations.***

CCSSM CATEGORY	CCSSM DOMAIN	CCSSM CLUSTERS (*Italicized text* indicates SBAC College & Career Readiness emphases)	Mathematics COMPETENCIES
FUNCTIONS	**Interpreting Functions & Trigonometric Functions**	• *Understand the concepts of a function and use function notation* • *Interpret functions that arise in applications in terms of the context* • *Analyze functions using different representations* • Extend the domain of trigonometric functions using the unit circle	***8. Competency: Students will demonstrate the ability to interpret, analyze, and use functions when applied in a variety of contexts, including real-world phenomena.***
	Building Functions & Trigonometric Functions	• *Build a function that models a relationship between two quantities* • Build new functions from existing functions • Model periodic phenomena with trigonometric functions • Prove and apply trigonometric identities	***9. Competency: Students will demonstrate the ability to build functions that model relationships between two quantities.***
	Linear, Quadratic, and Exponential Models	• Construct and compare linear, quadratic, and exponential models and solve problems • Interpret expressions for functions in terms of the situation they model	***10. Competency: Students will demonstrate the ability to distinguish among situations that can be represented with linear, quadratic and exponential models and provide evidence to support reasoning.***

CCSSM CATEGORY	CCSSM DOMAIN	CCSSM CLUSTERS (*Italicized text* indicates SBAC College & Career Readiness emphases)	Mathematics COMPETENCIES
GEOMETRY	Congruence	• *Prove geometric theorems* • Experiment with transformation in the plane • Understand congruence in terms of rigid motions • Make geometric constructions	***11. Competency: Students will demonstrate the ability to use reasoning to construct and apply viable arguments about congruence.***
	Similarity, Right Triangles, and Trigonometry	• Understand similarity in terms of similarity transformations • Prove theorems involving similarity • Define trigonometric ratios and solve problems involving right triangles • (+) Apply trigonometry to general triangles	***12. Competency: Students will demonstrate the ability to use reasoning (e.g., properties of angles and triangles) to construct and apply viable arguments about similarity.***
	Circles	• Understand and apply theorems about circles • Find arc lengths and areas of sectors	***13. Competency: Students will demonstrate the ability to reason with and apply theorems about circles.***
	Expressing Geometric Properties with Equations	• Translate between the geometric description and the equation for a conic section • Use coordinates to prove simple geometric theorems algebraically	***14. Competency: Students will demonstrate the ability to apply algebraic models to express geometric relationships.***
	Geometric Measurement and Dimension	• Explain volume formulas and use them to solve problems • Visualize relationships between two-dimensional and three-dimensional objects • Modeling with Geometry	***15. Competency: Students will demonstrate the ability to explain, apply, and model geometric measurement formulas.***

CCSSM CATEGORY	CCSSM DOMAIN	CCSSM CLUSTERS *(Blue text = SBAC College & Career Ready emphases)*	Mathematics COMPETENCIES
STATISTICS AND PROBABILITY	**Statistics and Probability**	• Interpreting Categorical and Quantitative Data • *Summarize, represent, and interpret data on a single count or measurement variable* • Summarize, represent, and interpret data on two categorical and quantitative variables • Interpret linear models	***16. Competency: Students will demonstrate the ability to apply statistical methods or reasoning to summarize, represent, and interpret categorical and quantitative data.***
	Making Inferences and Justifying Conclusions	• Understand and evaluate random processes underlying statistical experiments. • Make inferences and justify conclusions from sample surveys, experiments and observational studies	***17. Competency: Students will demonstrate the ability to make inferences and justify or critique conclusions.***
	Conditional Probability and the Rules of Probability	• Understand independence and conditional probability and use them to interpret data • Use the rules of probability to compute probabilities of compound events in a uniform probability model	***18. Competency: Students will demonstrate the ability to apply the rules of probability including conditional probability to determine the likelihood of a given outcome.***
	Using Probability to Make Decisions	• Calculate expected values and use them to solve problems • (+) Use probability to evaluate outcomes of decisions	***19. (+) Competency: Students will apply probability concepts to analyze and evaluate potential decisions and strategies.***