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| **Common Core Standards for Mathematics**  **Grades 9-12 Matrix** |

| **Key:**  **√**  denotes a correlation in ideas and concepts in both standard and lessons  **x** denotes the ideas and concepts may not be directly addressed, but the ideas are supported in both lesson and activities  ● denotes an implied idea or concept that may be used in both lesson and activity |
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| **Grade 6** |  |
| **Ratios and Proportional Relationships** |  |
| * Understand ratio concepts and use ratio reasoning to solve problems. | ● |
| **The Number System** |  |
| * Apply and extend previous understandings of multiplication and division to divide fractions by fractions. |  |
| * Compute fluently with multi-digit numbers and find common factors and multiples. |  |
| * Apply and extend previous understandings of numbers to the system of rational numbers. |  |
| **Expressions and Equations** |  |
| * Apply and extend previous understandings of arithmetic to algebraic expressions. |  |
| * Reason about and solve one-variable equations and inequalities. |  |
| * Represent and analyze quantitative relationships between dependent and independent variables. |  |
| **Geometry** |  |
| * Solve real-world and mathematical problems involving area, surface area, and volume. |  |
| **Statistics and Probability** |  |
| * Develop understanding of statistical variability. |  |
| * Summarize and describe distributions. |  |
| **Grade 7** |  |
| **Ratios and Proportional Relationships** |  |
| * Analyze proportional relationships and use them to solve real-world and mathematical problems. | ● |
| **The Number System** |  |
| * Apply and extend previous understandings of operations with fractions to add, subtract, multiply, and divide rational numbers. |  |
| **Expressions and Equations** |  |
| * Use properties of operations to generate equivalent expressions. |  |
| * Solve real-life and mathematical problems using numerical and algebraic expressions and equations. |  |
| **Geometry** |  |
| * Draw, construct and describe geometrical figures and describe the relationships between them. | ● |
| * Solve real-life and mathematical problems | ● |
| **Statistics and Probability** |  |
| * Use random sampling to draw inferences about a population. |  |
| * Draw Informal comparative Inferences about two populations. |  |
| * Investigate chance processes and develop. use, and evaluate probability models |  |
| **Grade 8** |  |
| **The Number System** |  |
| * Know that there are numbers that are not rational, and approximate them by rational numbers. |  |
| **Expressions and Equations** |  |
| * Work with radicals and integer exponents. |  |
| * Understand the connections between proportional relationships, lines, and linear equations. | ● |
| * Analyze and solve linear equations and pairs of simultaneous linear equations. |  |
| **Functions** |  |
| * Define, evaluate, and compare functions. |  |
| * Use functions to model relationships between quantities. |  |
| **Geometry** |  |
| * Understand congruence and similarity using physical models, transparencies, or geometry software. | x |
| * Understand and apply the Pythagorean Theorem. |  |
| * Solve real-world and mathematical problems involving volume of cylinders, cones and spheres. |  |
| **Statistics and Probability** |  |
| * Investigate patterns of association in bivariate data. |  |

**High School Mathematics**

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| **Number and Quantity** |  |
| **The Real Number System** |  |
| * Extend the properties of exponents to rational exponents |  |
| * Use properties of rational and irrational numbers. |  |
| **Quantities** |  |
| * Reason quantitatively and use units to solve problems |  |
| **The Complex Number System** |  |
| * Perform arithmetic operations with complex numbers |  |
| * Represent complex numbers and their operations on the complex plane |  |
| * Use complex numbers in polynomial identities and equations |  |
| **Vector and Matrix Quantities** |  |
| * Represent and model with vector quantities. |  |
| * Perform operations on vectors. |  |
| * Perform operations on matrices and use matrices in applications. |  |
| **Algebra** |  |
| **Seeing Structure In Expressions** |  |
| * Interpret the structure of expressions |  |
| * Write expressions in equivalent forms to solve problems |  |
| **Arithmetic with Polynomials and Rational Expressions** |  |
| * Perform arithmetic operations on polynomials |  |
| * Understand the relationship between zeros and factors of polynomials |  |
| * Use polynomial identities to solve problems |  |
| * Rewrite rational expressions |  |
| **Creating Equations** |  |
| * Create equations that describe numbers or relationships |  |
| **Reasoning with Equations and Inequalities** |  |
| * Understand solving equations as a process of reasoning and explain the reasoning |  |
| * Solve equations and inequalities in one variable |  |
| * Solve systems of equations |  |
| * Represent and solve equations and inequalities graphically |  |
| **Functions** |  |
| **Interpreting Functions** |  |
| * Understand the concept of a function and use function notation |  |
| * Interpret functions that arise in applications in terms of the context |  |
| * Analyze functions using different representations |  |
| **Building Functions** |  |
| * Build a function that models a relationship between two quantities |  |
| * Build new functions from existing functions |  |
| **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 |  |
| **Trigonometric Functions** |  |
| * Extend the domain of trigonometric functions using the unit circle |  |
| * Model periodic phenomena with trigonometric functions |  |
| * Prove and apply trigonometric identities |  |
| **Geometry** |  |
| **Congruence** |  |
| * Experiment with transformations in the plane | ● |
| * Understand congruence in terms of rigid motions |  |
| * Prove geometric theorems |  |
| * Make geometric constructions |  |
| **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 |  |
| **Circles** |  |
| * Understand and apply theorems about circles | ● |
| * Find arc lengths and areas of sectors of 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 |  |
| **Geometric Measurement and Dimension** |  |
| * Explain volume formulas and use them to solve problems |  |
| * Visualize relationships between two dimensional and three-dimensional objects | X |
| **Modeling with Geometry** |  |
| * Apply geometric concepts in modeling situations | ● |
| **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 |  |
| **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 |  |
| **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 |  |
| **Using Probability to Make Decisions** |  |
| * Calculate expected values and use them to solve problems |  |
| * Use probability to evaluate outcomes of decisions |  |

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| **Algebra I** |  |
| **Unit 1 - Relationships Between Quantities and Reasoning with Equations** |  |
| * Reason quantitatively and use units to solve problems. |  |
| * Interpret the structure of expressions. |  |
| * Understand solving equations as a process of reasoning and explain the reasoning. |  |
| * Create equations that describe numbers or relationships |  |
| * Solve equations and inequalities in one variable. |  |
| **Unit 2 - Linear and Exponential Relationships** |  |
| * Extend the properties of exponents to rational exponents. |  |
| * Solve systems of equations |  |
| * Represent and solve equations and inequalities graphically |  |
| * Understand the concept of a function and use function notation. |  |
| * Interpret functions that arise in applications in terms of a context. |  |
| * Analyze functions using different representations |  |
| * Build a function that models a relationship between two quantities |  |
| * Build new functions from existing functions. |  |
| * Construct and compare linear, quadratic, and exponential models and solve problems. |  |
| * Interpret expressions for functions in terms of the situation they model. |  |
| **Unit 3 - Descriptive Statistics** |  |
| * 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. |  |
| **Unit 4 - Expressions and Equations** |  |
| * Interpret the structure of expressions. |  |
| * Write expressions in equivalent forms to solve problems. |  |
| * Perform arithmetic operations on polynomials. |  |
| * Create equations that describe numbers or relationships. |  |
| * Solve equations and inequalities in one variable. |  |
| * Solve systems of equations. |  |
| **Unit 5 - Quadratic Functions and Modeling** |  |
| * Use properties of rational and irrational numbers. |  |
| * Interpret functions that arise in applications in terms of a context. |  |
| * Analyze functions using different representations |  |
| * Build a function that models a relationship between two quantities. |  |
| * Build new functions from existing functions. |  |
| * Construct and compare linear, quadratic, and exponential models and solve problems. |  |

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| **Geometry** |  |
| **Unit 1 – Congruence, Proof, and Constructions** |  |
| * Experiment with transformations in the plane. |  |
| * Understand congruence in terms of rigid motions. |  |
| * Prove geometric theorems. |  |
| * Make geometric constructions. | ● |
| **Unit 2 – Similarity, Proof, and Trigonometry** |  |
| * Understand similarity in terms of similarity transformations |  |
| * Prove theorems involving similarity |  |
| * Define trigonometric ratios and solve problems involving right triangles |  |
| * Apply geometric concepts in modeling situations |  |
| * Apply trigonometry to general triangles |  |
| **Unit 3 - Extending to Three Dimensions** |  |
| * Explain volume formulas and use them to solve problems | ● |
| * Visualize the relation between two-dimensional and three-dimensional objects | **X** |
| * Apply geometric concepts in modeling situations |  |
| **Unit 4 - Connecting Algebra and Geometry through Coordinates** |  |
| * Use coordinates to prove simple geometric theorems algebraically |  |
| * Translate between the geometric description and the equation for a conic section |  |
| **Unit 5 - Circles With and Without Coordinates** |  |
| * Understand and apply theorems about circles. | ● |
| * Find arc lengths and areas of sectors of circles |  |
| * Translate between the geometric description and the equation for a conic section |  |
| * Use coordinates to prove simple geometric theorem algebraically. |  |
| * Apply geometric concepts in modeling situations |  |
| **Unit 6 - Applications 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 |  |
| * Use probability to evaluate outcomes of decisions. |  |

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| **Algebra II** |  |
| **Unit 1 - Polynomial, Rational, and Radical Relationships** |  |
| * Perform arithmetic operations with complex numbers. | **•** |
| * Use complex numbers in polynomial identities and equations. | ● |
| * Interpret the structure of expressions. | ● |
| * Write expressions in equivalent forms to solve problems. | ● |
| * Perform arithmetic operations on polynomials. |  |
| * Understand the relationship between zeros and factors of polynomial |  |
| * Use polynomial identities to solve problems. |  |
| * Rewrite rational expressions. |  |
| * Understand solving equations as a process of reasoning and explain the reasoning. | ● |
| * Represent and solve equations and inequalities graphically. | ● |
| * Analyze functions using different representations. |  |
| **Unit 2 - Trigonometric Functions** |  |
| * Extend the domain of trigonometric functions using the unit circle. | ● |
| * Model periodic phenomena with trigonometric function. |  |
| * Prove and apply trigonometric identities. |  |
| **Unit 3 - Modeling with Functions** |  |
| * Create equations that describe numbers or relationships. | ● |
| * Interpret functions that arise in applications in terms of a context. | ● |
| * Analyze functions using different representations. |  |
| * Build a function that models a relationship between two quantities. |  |
| * Build new functions from existing functions. |  |
| * Construct and compare linear, quadratic, and exponential models and solve problems. |  |
| **Unit 4 - Inferences and Conclusions from Data** |  |
| * Summarize, represent, and interpret data on single count or measurement variable. | ● |
| * Understand and evaluate random processes underlying statistical experiments. |  |
| * Make inferences and justify conclusions from sample surveys, experiments and observational studies. |  |
| * Use probability to evaluate outcomes of decisions. |  |

Comparison of *Common Core Standards for Mathematics* and the *Autodesk® Digital STEAM Workshop*

Source: *CommonCore Standards for Mathematics*