Common Core State Standards for Mathematics

Common Core State Standards for Mathematics	Talent Development Alignment Statements
Common Core State Standards for Mathematical Practice	Each Talent Development mathematics curriculum affords students the opportunity to investigate and experiment with manipulatives, symbolic mathematics, and verbal communication to develop a deeper sense of mathematics. Students who engage in TD Math curricula find that they develop naturally the strategic thinking needed to persevere into deeper, advanced high school mathematics and eventually college and career. TD Mathematics helps foster students' interest in discovering how and why math works and how it best represents the patterns and phenomena in their everyday world.
1 Make sense of complex problems and persevere in solving them	TD Mathematics courses are specifically designed to allow for multiple entry points to its topics and concepts. Students find that in each TD course they will learn to make connections between equations, verbal descriptions, tables, and graphs. Each TD Mathematics class begins with "Problems of the Day." These PODs engage students in a variety of cognitive connections from topics such as "Does this make sense?" to "What is the misconception?" TD Math teachers encourage whole-class discussions of student thinking to clarify the mathematics' topic at hand and elicit students' thought process through a mathematical idea. Students are encouraged throughout TD Mathematics to share ideas and thoughts orally and in writing to persevere when problem solving.
2 Reason abstractly and quantitatively	Throughout TD Mathematics courses, students communicate verbally and in writing to peers and instructor. Students are encouraged to explain their reasoning, often stating assumptions, giving quantitative and abstract descriptions, and justifying their thinking. Each TD course helps students build links between and foundations for reasoning concretely and abstractly.
3 Construct viable arguments and critique the reasoning of others	Oral and written communication among peers and between teacher and students is a vital component of Talent Development math courses. Students, as well as teachers, often need to clarify assumptions, construct reasonable arguments, and make conjectures. Because of the importance of constructing viable arguments, the first unit of *Transition to Advanced Mathematics* (TAM) specifically addresses making conjectures, determining counter examples, and using inductive reasoning. By working in partnerships and sharing ideas at the front of class, students have opportunities to critique others' reasoning.
4 Model with mathematics	TD Mathematics courses incorporate opportunities and activities for students to model many applications. Using symbols, manipulatives, drawings, and graphing conventions students model mathematical relations and patterns related to many career fields and mathematical generalizations.

5 Use appropriate tools strategically	Because of TD Math's constructivist-based approach to many topics, students have the opportunity to use and develop understanding of many mathematical tools. As students successfully encounter TD lessons and components, they will build understanding of many mathematical tools, such as paper and pencil, rulers, protractors, transparent paper, transparent mirrors, two-color tiles, dry-erase graph boards, and graphing calculators. These encounters lay the foundation for students to accept and adjust to other mathematical tools in high school, college, and careers. These include spreadsheets, computer algebra software, statistical packages, and geometry software.
6 Attend to precision	Throughout TD Mathematics implementation, teachers and students are encouraged to think aloud and share their mathematical ideas. Strong communication among students results often in a natural emphasis on precision. Students develop stronger communication skills in order to clarify assumptions and use terminology properly. TD Math's constructivist-based approach to many of the concepts and ideas allow teachers and students the opportunity to develop and adapt definitions of terms as needed. Strong emphasis is placed on using word walls and vocabulary organizers so students benefit from new mathematics terms. In TD's consumable materials, students are prompted to write more than just numeric answers to many problems, but to write complete sentences that help "explain the math" and emphasize the precision of units.
7 Look for and make use of structure	TD courses offer students multiple opportunities to look for and make use of structure to solidify their mathematical understanding. In exploring patterns that model real-world phenomenon, students are encouraged to communicate these patterns both in writing and orally to teacher and other students. Multiple methods of structuring a pattern with tables, graphs, equations (functions), and orally occur throughout the TD math courses. This helps students develop a solid foundation to explore more complicated mathematical topics in future core mathematics courses.
8 Look for and express regularity in repeated reasoning	Students, with support of their teacher, have multiple opportunities to develop a deeper understanding of some of the algorithms and shortcuts used in high school mathematics. Students also have the opportunity to develop habits of mind needed for future reasoning in core mathematics courses. Throughout TD Mathematics courses their "Problems of the Day," students have the opportunity to generalize mathematical phenomena by exploring patterns, using manipulatives, and constructing understanding.

Common Core State Standards for Mathematical Content: Mathematical Standards for High School	The TD mathematics courses are an excellent opportunity for students to re-engage in foundational concepts and skills needed for high school mathematics. Each course has been carefully developed to give students multiple entry points and constructed learning in specific content areas. Students will link to prior knowledge, construct conceptual understanding, develop skills, and reflect on their thinking as they investigate topics in number and quantity, algebra, functions, modeling, geometry, and statistics and probability.
Mathematics|High School – Number and Quantity: Number and Number Systems	***Transition to Advanced Mathematics*** Students work toward a better understanding of the number concepts and skills needed to transition to high school algebra. **Unit 1: Mathematical Reasoning, Data Analysis, and Probability:** students work with natural numbers to solidify understanding of prime and composite numbers as well as factors of a natural number. **Unit 2: Numbers and Integers**: students specifically construct knowledge of natural numbers, whole numbers, and integers. Students develop an intuitive sense of how to add, subtract, multiply, divide integers by relating to hands-on manipulatives such as two-colored tiles. **Unit 3: Rational Numbers**: students reconstruct knowledge of rational numbers by developing an intuitive sense of relative and absolute mathematical reasoning. Students then revisit the reasoning behind the algorithms of adding, subtracting, multiplying, and dividing rational numbers. Throughout this unit students use "percent" as a foundation to understand rational numbers. The unit concludes with investigations of ratios and rates. **Problems of the Day:** students encounter a variety of interactions with the concept of numbers that help them rethink and communicate their understanding of comparing numbers, estimating number answers, and solving multi-step problems involving fractions and percentages. ***Geometry Foundations*** Connections from the basic concept and skills of numbers are made to such things as coordinate plane and measurements. Students and teachers are encouraged to use estimation and approximation to confirm and pre-determine solutions. A cyclical review of using and making sense of numbers is spread throughout the lessons' "Problems of the Day." ***Algebra II Foundations*** **Unit 1: Solving One-Variable Equations**: students review basic mathematical properties related to integers and rational numbers, such as the associative, commutative, distributive, and identity properties.

	Unit 5: Probability & Statistics: students review scientific notation in order to understand solutions to problems involving factorial. ***Career Academy Blended Mathematics*** A basic understanding of numbers will be needed to complete most of the CABM lessons. The "Difference Boxes" lesson specifically emphasizes integers and real numbers.
Mathematics|High School – Number and Quantity: Quantities	***Transition to Advanced Mathematics*** TD student materials are consumable to help students become better communicators of mathematics. We encourage teachers to urge students to use the consumable materials to their advantage by writing complete sentences when answering many of the exercises and to include the proper units in the answers. **Unit 1: Mathematical Reasoning, Data Analysis, and Probability**: students read and create graphs and tables that incorporate the correct use of quantities and units of the data. **Unit 3: Rational Numbers**: students specifically relate rational numbers to units. For example, students will come to understand such things as 1/3 of a gallon is a different quantity than 1/3 of a cup. Students will work with derived quantities as related to rates, such as miles per hour. **Unit 4: Measurement**: students consistently reference the appropriate units for the applications related to length, area, and angle measurements. A variety of exercises in the daily "Problems of the Day" relate to using units correctly in answers and applying addition and subtraction to quantities of the same unit. ***Geometry Foundations*** The use of units in many of the answers in *Geometry Foundations (GF)* is important. Students often answer, or expound on numeric answers, in sentence form. This allows teachers to emphasize the use of correct units in answers. **Unit 1: Introduction to Geometry:** students use proper units to determine the unknown side lengths of similar triangles. **Unit 2 Measurement**: students use unit cancelation to arrive at the correct solution to conversion problems. **Unit 3: Properties of Units**: students use the correct units in solutions and on graphs to problems involving length, area, and volume. **Unit 4: Coordinate Geometry**: students correctly use area and length units in solving problems and using the Pythagorean Theorem.

	Unit 5: Language of Geometry: students use the correct unit in solving problems related to similar objects. "Problems of the Day" offer a daily, random assortment of problems in which proper use of quantity units is important. Teachers have ample opportunities for discussions of quantity from the variety of problems offered in the PODs. ***Algebra II Foundations*** To apply mathematical ideas students need to be consistent with using units in their solutions as well as interpreting a scenario. Students that complete all five *Algebra II Foundations (AIIF)* units will have experiences in applying quantity in various situations. **Solving One-Variable Equations**: students investigate two-color tiles to gain a better understanding of integers and operation with integers. Some applications also include units related to measurement, percent, and money. **Linear Functions**: with the emphasis of function, students need to review and conceptually understand quantity as it applies to units related to a scenario, a table of ordered pairs, and the label of axes on the coordinate plane for graphing. **Systems of Equations:** solving systems of equations are created from real-world scenarios. Accordingly, students have ample opportunities to work with quantity attributes related to units such as money and number of items sold. **Non-Linear Equations**: to better understand non-linear functions, students are introduced to a variety of scenarios comparing units, such as profit functions, investment/interest functions, and population functions. **Probability & Statistics**: developing the concepts and skills related to probability and statistics comes from and is related to real-world situations that involve quantity. In the "Problems of the Day," students will cycle through random problems that increase their understanding and comfort level with various applications of quantity concepts and skills. ***Career Academy Blended Mathematics*** Because the CABM lessons are built upon real-world applications, the proper use of units will be emphasized throughout. For example, in the "Sports Jump" lesson students will record measurement units correctly for distance and time as they relate to individual number solutions as well as relations to comparisons on a distance time graph.

Mathematics|High School – Algebra: Expressions	***Transition to Advanced Mathematics*** Throughout *Transition to Advanced Mathematics* students will construct knowledge around basic operations of addition, subtraction, multiplication, and division of integers and rational numbers, giving students a foundation of writing numeric expressions. **Unit 5: Patterns and Functions; Introduction to Algebra**: students manipulate numeric expressions with the correct order of operations, rewrite numeric and variable expressions in equivalent forms, and use the order of operations in reverse to undo operations in expressions. In many "Problems of the Day," students engage with understanding and applying symbol manipulation of expressions. ***Geometry Foundations*** Through the use of formulas and algebraic connections to geometry, students are able to review and develop skills and understanding related to manipulating expressions in equations. Cyclical review of using the rules of arithmetic to simplify expressions is embedded in the GF's "Problems of the Day." ***Algebra II Foundations*** Expressions are one of the main building blocks for functions. AIIF begins with an emphasis on understanding expressions and property relationships. **Solving One-Variable Equations**: students use the basic properties of mathematics to manipulate expressions. Two-color tiles are used to help visually emphasis conceptual understanding of the symbol manipulations. **Linear Functions**: students apply linear expressions to graphing and solving problems as the expressions relate to corresponding equations and functions. **Systems of Equations:** students apply expression-related concepts and skills to systems of equations. **Non-Linear Equations**: foundational understanding of expressions is used to understand non-linear function applications and graphing. **Probability & Statistics**: students better understand the fundamental counting principal, factorial notation, combinations, and permutations through the use of expressions. In AIIF's "Problems of the Day," students will encounter a variety of applications and review opportunities for mathematical expressions.

	Career Academy Blended Mathematics A solid understanding of expression notation and symbol manipulation will be needed as a foundation for work with equations and functions. Teachers and students will have multiple entry points for discussions involving expressions. For example, in the "Luminosity" lesson, students will manipulate symbols to solve a system of equations.
Mathematics|High School – Algebra: Equations and Inequalities	***Transition to Advanced Mathematics*** Students build the arithmetic foundation needed to create and manipulate equations at an algebra level. **Unit 4: Measurement**: students use equations in formula form to investigate areas and perimeters. Students also construct knowledge around the equation and pictorial representations of the Pythagorean Theorem and slope formula. **Unit 5: Patterns and Functions; Introduction to Algebra**: students develop a deeper understanding of equations by first exploring equivalent expressions and equations. Students then use rules of arithmetic to solve one-step and two-step equations to find the value of the variable that makes the original equation true. "Problems of the Day," allow students an opportunity to review and cycle through various linear equations in one-variable to solve for the unknown. ***Geometry Foundations*** Students will be exposed to using and manipulating basic geometry formulas to solve for unknowns throughout *Geometry Foundations.* **Unit 1: Introduction to Geometry**: students create and solve simple equations related to vertical and horizontal lines on a coordinate plane, use an equation to solve for unknowns in a relationship between degrees and number of rotational symmetries, and solve for unknown variables in a variety of basic mathematical formulas. **Unit 2: Measurement**: students use and manipulate area formulas to solve for unknown side lengths and areas in basic application problems. Students also apply proportion equations to solve for the unknown lengths in similar triangle real-world applications. **Unit 3: Properties of Objects**: students solve problems by engaging in a variety of equations to manipulate and use. They use the equation of a circle; the sum of the interior angles to create equations to solve for unknown angles in triangles and quadrilaterals; the area formulas of triangles, squares, rectangles, parallelograms, rhombi, and trapezoids to solve for unknowns; and the Pythagorean Theorem.

	Unit 4: Coordinate Geometry: students construct understanding of and use the slope, distance, and midpoint formulas. **Unit 5: Language of Geometry**: students review and apply proportion equations related to similar objects. ***Algebra II Foundations*** As students prepare for more abstract symbol manipulation and conceptual understanding they encounter a variety of experiences related to equations. **Solving One-Variable Equations**: students develop a conceptual understanding of solving one-variable equations using two-color tiles. **Linear Functions**: students apply equation understanding to linear functions and linear inequalities. **Systems of Equations:** students develop a conceptual understanding of solving a system equations using two-color tiles and various applications. **Non-Linear Equations**: students apply knowledge of equations as they investigate non-linear functions. **Probability & Statistics**: students work with and develop mathematical understanding of equations related to probability and statistics, such as the equation for combinations, permutations, and expected value. "Problems of the Day" throughout the year give students the opportunity to encounter and review various equation skills and conceptual understandings. ***Career Academy Blended Mathematics*** Various applications, uses, and symbol manipulation of equations will occur throughout the CABM lessons. Students review and develop conceptual understanding and skills related to solving one-variable equations, solving systems of equations, and graphing equations. For example, in the "Auto Racing" lesson, students will solve for the radius of curvature by using substitution and the Pythagorean theorem.
Mathematics|High School – Functions	***Transition to Advanced Mathematics*** *Transition to Advanced Mathematics* builds a foundation of arithmetic understanding needed for more advanced high school topics such as functions. **Unit 3: Rational Numbers:** students investigate rates and ratios as a foundation for future and advanced work with proportional relationships.

	Unit 4: Measurement: students develop an understanding in graphing ordered pairs on a coordinate plane. Students also work with graphing lines through two ordered pairs on a graph to investigate the slope of lines. Both of these concepts are foundations for future advanced understanding of functional concepts and skills. **Unit 5: Patterns and Functions; Introduction to Algebra**: students are introduced to a function's concept and symbol representation. This unit also explores the relationship between a table of ordered pairs and the corresponding graphs. Students investigate the graphical models of various relationships between two quantities. ***Geometry Foundations*** Throughout *Geometry Foundations*, students are exposed to using and manipulating many basic geometry formulas such as, the area of a triangle formula, area of a rectangle formula, area of a parallelogram formula, and distance formula. ***Algebra II Foundations*** A large part of AIIF is related to and centered around functional understanding. The early development of expressions and equations in Unit 1 leads to a foundational development of linear and non-linear conceptual understanding in Units 2 and 4. **Solving One-Variable Equations:** students develop the foundational understanding of expressions, equations, and solving equations in order to better understand functions in later units. **Linear Functions**: students investigate linear functions, including symbol manipulation, tables, graphs, and scenario applications. A basic introduction to function notation and applying linear functions to linear regression is also covered. **Non-Linear Functions**: students extend linear function understanding to non-linear functions that include quadratic, step, power, exponential, absolute value, and piece-wise functions. ***Career Academy Blended Mathematics*** As students investigate real-world applications they encounter a variety of functions and functional concepts in the CABM lessons. For example, in the "Puff Pastry" lesson, students will model the layers of a pastry with an exponential function.

Mathematics|High School – Modeling	***Transition to Advanced Mathematics*** One of TAM's goals is help students learn to describe the world around them by describing patterns and relationships mathematically wherever possible. Students are encouraged throughout to give written descriptions and communicate orally their thoughts and understandings of numerical situations, geometric shapes, and more abstract algebraic concepts. It is common to hear teachers ask students about their assumptions when they are describing how to model their solutions to various problems. **Unit 1: Mathematical Reasoning, Data Analysis, and Probability**: students review and learn how to describe and model number patterns related to: • prime and composite numbers • data • physical objects • situations involving probability and statistics. **Unit 2: Numbers and Integers**: students investigate the properties and conceptual understanding of integers by using two-color tiles to model adding, subtracting, multiplying, and dividing integers. **Unit 3: Rational Numbers**: students explore and develop understanding of rational numbers by using area models to add and subtract with common units. Students also use area models to represent multiplication of rational numbers. **Unit 4: Measurement**: students model various measurement concepts related to length, area, and angles by creating their own measurement tools and then transition to the traditional measurement tools and units. **Unit 5: Patterns and Functions; Introduction to Algebra**: students model expressions, equations, and solving equations by manipulating two-color tiles and drawing graphic organizers. Throughout TAM's "Problems of the Day," students have a chance to interact with various applications of modeling situations mathematically.
	Geometry Foundations Because of GF's goal of constructing conceptual understanding of foundational geometry ideas, students will have ample opportunity to interact with modeling to discover, confirm, or represent these ideas. **Unit 1: Introduction to Geometry**: students investigating chromatic numbers by modeling four-color problems. Students model lines of symmetry by using a transparent mirror and folding paper. Rotational symmetries are modeled with transparent paper. Students also model patterns graphically and similarities between objects with paper cutouts.

Unit 2: Measurement: In this unit students model:

- relationships between body parts by collecting data and graphing scatter plots
- determining area using grid squares
- average stride length by walking along a tape measure
- finding the distance between locations using the mathematics behind similar triangles with a range finder,
- with a graph to find the maximum area within a fence given a certain perimeter
- the concepts behind volume with three-dimensional cubes and object nets.

Unit 3: Properties of Objects: In this unit students model:

- the concept of circle by plotting points and representing circles with equations
- arcs and circles with a compass
- characteristics of a triangle with segment cut outs
- the sum of interior angle by cutting out the three angles of a triangle and a quadrilateral
- the sum of the interior angles of a triangle with algebraic statements
- various types of triangles using compasses, rulers, and/or protractors
- characteristics of quadrilaterals by measuring attributes and recording information in a table
- the concept behind the area of a parallelogram by cutting and rearranging two parts of a parallelogram
- the physical attributes of the Pythagorean theorem by manipulating and rearranging pieces of squares that form the sides of a right triangle
- applications of the center of mass, circumscribed circles, and inscribed circles.

Unit 4: Coordinate Geometry: In this unit students model:

- representing order pairs in simple applications, tables, and connected scatter plots by hand and with a graphing calculator
- variations in slope with miniature roofs and graphs
- parallel and perpendicular situations with graphs of lines on a coordinate plane and ratios for slope
- finding the distance between two points with the Pythagorean theorem and the distance formula
- planes, lines, and points in space with cardstock, string, and small cubes
- 3D representation by creating perspective drawings;
- the concept of sun light and light from a flash light with the concept of ray

	• proportional reasoning with similar objects . Various figures, diagrams, scenarios, equations, and expressions are used in the "Problems of the Day" to model high school mathematics concepts.
	Algebra II Foundations Staying true to developing conceptual understanding of mathematics, AIIF incorporates a variety of modeling from using two-color tiles to applications. In Unit 1, two-color tiles are used for students to better understand operations related to integers and for solving one-variable equations. Two different types of graphic organizers are used to model "doing" and "undoing" operations in the correct order. This is used as a foundation for the order of operations needed to simplify expressions and solving equations. Students model inequality understanding by graphing on a number line and shading appropriate areas of Venn diagrams. Students use scale drawing to apply proportional reasoning and mathematics as it relates to similar objects. In Unit 2, graphing scatter plots are used to better understand the relationship between tables, graphs, and linear functions. Students work with patterns from diagrams or from physical cutouts to establish a table, graph, and corresponding linear function. At the conclusion of the unit, students will model the general trend of linear data with linear regression techniques. In Unit 3, various tables, two-color tiles, scenarios, balance scales, and drawings of objects will be used to develop conceptual understanding of systems equations and solving systems of equations. In Unit 4, students will link graphical attributes of non-linear functions to the corresponding symbolic parameters. Modeling with graphing calculators helps students discover the relationships between graphs and functions. Real-world applications will link to functional understanding in various scenarios to give students a context for functions. To better understand probability and statistics, students will encounter a variety of models in Unit 5. For example, students will gain understanding of the fundamental counting principle by investigating electing student council members, painting fingernails, dealing cards, and creating license plates. Tree diagrams will be used to help students understand permutations and lottery forms to understand combinations. Mazes will be used to apply multiplying probabilities. Most of the "Problems of Day" have a related diagram or application to give meaning to mathematics in the problem.

	Career Academy Blended Mathematics By design, the CABM lessons involve a high level of modeling real-world scenarios with tables of values, graphs, functions, and/or equations. For example, in the Tree Height vs. Price lesson, students graph data of various tree heights from a table and determine matching linear equations.
Mathematics|High School – Geometry	***Transition to Advanced Mathematics*** Because an understanding of shape is useful in modeling and describing the world in which students live, *Transition to Advanced Mathematics* will often use shapes and objects to drive the conceptual development of arithmetic and algebraic mathematical topics and ideas. Making connections between equations (functions), tables of ordered pairs, graphs, and scenarios are an important foundation for students. Transition to Advanced Mathematics emphasizes using the coordinate plane with ordered pairs to develop understanding of slope and functions. **Unit 1: Mathematical Reasoning, Data Analysis, and Probability**: students investigate rectangular models to understand the factors of whole numbers. Students also investigate a pattern of shapes to model the change in shapes algebraically with an expression rule. This unit also lays a foundation of making and testing conjectures. **Unit 2: Numbers and Integers**: students use two-color square tiles and area type models to investigate the properties of operations related to integers. **Unit 3: Rational Numbers**: students use area models to investigate rational numbers and operations on rational numbers. **Unit 4: Measurement**: Geometric objects related to length, area, and angles are used to construct understanding of measurement. An area investigation of the Pythagorean Theorem helps students visually make a connection between the three sides of a right triangle. Students use the locations of ordered pairs in tables and on graphs to explore the slopes of lines. **Unit 5: Patterns and Functions; Introduction to Algebra**: the square and rectangular shapes of two-color tiles are used to represent the area model of equivalent symbolic equations in order to give students a visual model of solving equation. Tables and graphs are used to explore attributes of functions as well as functional behavior of two quantities. Numerous “Problems of the Day” use shapes and mathematics related to shape in order for students to review mathematical concepts and relationships.

Geometry Foundations

Geometry Foundations units supply a rich foundation for students to build knowledge in geometry. *Geometry Foundations* uses shapes and attributes of shapes to drive much of the constructivist-based discovery in the activities. Mathematics related to coordinates is a vital component to understanding geometry; therefore, teachers and students will find many applications of the coordinate plane throughout *Geometry Foundations*.

Unit 1: Introduction to Geometry: students investigate rotational symmetry, lines of symmetry, and similar objects. In addition, students specifically use the coordinate plane to understand and work with vertical and horizontal lines as well as graphing relationships between two variables.

Unit 2: Measurement: students explore area and volume constructing understanding of common and traditional measurement formulas for two-dimensional and three-dimensional objects. In addition, students graph scatter plots on the coordinate plane representing the relationships between variables. Students determine the maximum of a graph by visual examination and by referencing the table of ordered pairs.

Unit 3: Properties of Objects: investigations related to basics shapes of triangles, quadrilaterals, and circles help students construct understanding of the basic properties of objects. Ordered pairs are used to plot points of a circle on the coordinate plane. Also, the Pythagorean Theorem is explored.

Unit 4: Coordinate Geometry: the coordinate plan and ordered pairs are consistently used in this unit to model mathematical concepts and ideas related to slope, parallel lines, perpendicular lines, the distance formula, and the midpoint formula. Students experience a brief introduction to coordinate proof as they explore geometric shapes on a coordinate plane.

Unit 5: Language of Geometry: students investigate the basic objects of geometry: point, lines, planes, space, segments, rays, and angles. The coordinate plane is also used to develop an understanding of point and plane.

Algebra II Foundations

The use of geometry will be needed periodically throughout AIIF to investigate scenarios related to functions, equations, probability, and statistics. Students review a variety of shape-related scenarios in the "Problems of the Day." Because of the emphasis of the interconnectedness of graphs, tables, scenarios, and functions, an understanding of coordinates will be reviewed early in the Linear Functions Unit and consistently used throughout the remainder of the Linear Functions Unit and much of the Non-Linear Functions Unit.

	Career Academy Blended Mathematics Understanding geometry is important for applying mathematics in the CABM lessons. For example, in the "Auto Racing" lesson, students apply the understanding of circles and the equation for circle in relationship to race cars going through a curve in a race. In the "Luminosity" lesson, students compare area relationships of similar objects to better understand the "Inverse Square Law." An understanding of coordinates is needed for many CABM lessons, in order to discover patterns found in data represented in tables and graphs. For example, in the "Chocolate Data Analysis" lesson, students graph the coordinates of year compared to cents per pound of cocoa beans to determine trends and patterns.
Mathematics|High School – Probability and Statistics	***Transition to Advanced Mathematics*** Because probability and statistics are important topics for lifelong applications, *Transition to Advanced Mathematics* begins with "Mathematical Reasoning, Data Analysis, and Probability." In Unit 1, students investigate simple probability facts related to such things as flipping a coin and drawing a random ticket. Students will use tree diagrams to model all possible outcomes of a sample space. A brief introduction to notation used for probability is given. Descriptive statistics are explored as well as representing data. In Unit 3, students build understanding of rational numbers related to percent and ratios in order to have a solid foundation for future representations of probability as numerical numbers. In various Problems of the Day, students will encounter probability foundational ideas related to sample space, intuitive probability thinking, and calculating probabilities of an outcome. ***Geometry Foundations*** *Geometry Foundations* builds a foundation for understanding area that will help students succeed in geometric applications of probability related to area. ***Algebra II Foundations*** The last unit of AIIF is dedicated to the development of understanding and skills related to probability and statistics. Students will investigate the fundamental counting principle, permutations, and combinations to understand sample space and possible outcomes. Students will investigate theoretical and experimental probability as well as independent and dependent probabilities as they work through various hands-on manipulations of cards, dice, and mazes. Students will apply probability mathematics to expected winnings of such things as raffles and lottery.

	Career Academy Blended Mathematics In the current stage of design, no CABM lesson specifically addresses probability. Future development of additional CABM lessons may include specific applications of probability.