

Current Standard:

Mathematical Concepts and Applications

Shape, Space, and Measurement- Primary

A student shall apply concepts of shape, space, and measurement to solve problems involving two- and three-dimensional shapes by demonstrating an understanding of:

1. patterns by describing, extending, and completing existing patterns; creating new patterns; representing spatial patterns pictorially, numerically, or both; and identifying, creating, or identifying and creating symmetrical patterns;
2. measurement, given familiar objects, to identify type of measurement required, estimate measurement, select appropriate tools and units of measurement, measure accurately, and use measurements to order a group of objects according to size;
3. familiar two- and three-dimensional shapes by identifying shapes in real-world contexts; drawing, building, or drawing and building familiar shapes; sorting and classifying shapes; and predicting the results of flipping, sliding, or turning a shape; and
4. geometric terms used to describe spatial relations.

Mathematical Concepts and Applications

Shape, Space, and Measurement - Primary

Purpose: Explore three-dimensional objects and later, their two-dimensional faces, with a focus on developing shape, location, and measurement concepts

A. A student shall demonstrate an understanding of:

1. Shape and Space
 - a. patterns as either repeating or growing;
 - b. two-dimensional shapes as the images or footprints of three-dimensional shapes; and
 - c. names and attributes of different shapes.
2. Measurement
 - a. measurement as the number of repetitions of a single unit; and
 - b. measurement attributes of length, volume, weight, area, and time.

B. A student shall demonstrate the ability to:

1. Shape and Space
 - a. describe, represent, and extend existing visual patterns, and create new patterns;
 - b. recognize shapes in real-world contexts;
 - c. sort and classify shapes by their familiar attributes;
 - d. model familiar three- and two-dimensional shapes by building or drawing them;
 - e. recognize and create shapes that have symmetry; and
 - f. describe and compare the location or position of objects using common terms.
2. Measurement
 - a. predict what happens to an object as a result of flipping, sliding, and turning;
 - b. use measurement to order a group of objects;
 - c. use non-standard units and later, standard whole units, to measure familiar objects; and
 - d. develop measurement benchmarks for making comparisons and estimates.

Current Standard:
Mathematical Applications

Number Sense - Primary

A student shall use number relationships to represent information and solve problems by:

1. using whole numbers to represent numbers in more than one way, count and order, name and locate, measure, and describe and extend pattern;
2. demonstrating an understanding of place value, number relationships, relative size, and reasonableness of answers in problem-solving situations; and
3. solving problems and justifying thinking by selecting appropriate numbers and representations; using operations, patterns, and estimation; generating multiple solutions; organizing data using pictures and charts; and using concrete objects, diagrams, or maps to solve simple problems involving counting, arrangements, or routes.

Mathematical Applications

Number Sense - Primary

Purpose: Use whole number concepts, relationships and operations to represent information, solve problems, and justify reasoning

- A. A student shall demonstrate an understanding of:
1. multiple models of place value and the base-ten number system;
 2. relative position and magnitude of whole numbers;
 3. various approaches to addition and subtraction of whole numbers and the relationship between the two operations; and
 4. situations that suggest multiplication and division, for example, equal groupings of objects and sharing equally.
- B. A student shall demonstrate the ability to:
1. represent and use whole numbers in flexible ways including composing and decomposing tens, hundreds, and thousands;
 2. develop and use strategies for whole-number computations, with a focus on addition and subtraction;
 3. develop and use strategies for estimating, comparing, and ordering whole numbers;
 4. use a variety of methods and tools to compute, including objects, mental computation, estimation, paper and pencil, and calculators;
 5. use whole numbers to identify, describe, and predict both repeating and growing patterns; and
 6. organize and represent data using concrete objects, pictures, and graphs
 7. represent commonly used fractions including $\frac{1}{4}$, $\frac{1}{3}$, and $\frac{1}{2}$.

Current Standard:
Mathematical Concepts and Applications
Shape, Space and Measurement - Intermediate

A student shall:

1. describe and analyze two- and three-dimensional shapes and spaces using appropriate whole and partial units, including metric, to measure length, time, weight, volume, temperature, angle, and area, and using names and properties of common two- and three-dimensional shapes;
2. describe and compare two- and three-dimensional geometric figures existing in the physical world;
3. analyze and create new shapes by combining, dissecting, or transforming existing shapes;
4. extend or create geometric patterns to solve problems;
5. represent a three-dimensional space in two-dimensional view;
6. measure, including identifying type of measurement required, selecting appropriate tools and units of measurement, and measuring accurately;
7. estimate measurements by using appropriate units and comparisons to known objects or quantities; and
8. use maps or graphs to determine the most efficient routes.

Mathematical Applications
Shape, Space, and Measurement - Intermediate

Purpose: Investigate, visualize, and classify two- and three-dimensional shapes and their attributes with a focus on developing geometric vocabulary and applying standard units of measure

- A. A student will demonstrate an understanding of:
1. Shape and Space
 - a. geometric attributes and properties including parallel, perpendicular, vertices, edges, faces, length, area and congruency.
 2. Measurement
 - a. standard units in the metric and customary systems; and
 - b. geometric vocabulary used to describe location, movement and direction.
- B. A student will demonstrate the ability to:
1. Shape and Space
 - a. use mathematical language to explain the structure of a geometric pattern;
 - b. translate between a three-dimensional object and its two-dimensional representation;
 - c. classify two- and three-dimensional shapes according to their properties and develop definitions of classes of shapes, for example, triangles and pyramids; and
 - d. reason about the results of transforming shapes, including flipping, sliding, and turning.
 2. Measurement
 - a. use maps or graphs to determine distances and efficient routes;
 - b. estimate measurements by using appropriate units and comparisons to known objects or quantities;

- c. measure attributes of familiar objects using appropriate metric and customary whole and partial units; and
- d. select and apply appropriate standard units and tools to measure length, area, volume, weight, elapsed time, temperature, and the size of angles.

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Current Standard:
Mathematical Applications
Number Sense- Intermediate

A student shall:

1. demonstrate understanding of concepts of place value, variables, and equations; when and how to use number operations; when and how to use a variety of estimation strategies; addition, subtraction, and multiplication of single-digit multiples of powers of ten; and the reasonableness of calculator results;
2. use number concepts and a variety of math operations to represent information and solve problems;
3. solve a variety of multiple-step problems using number relationships and properties, number patterns, and appropriate computation or estimation procedures;
4. generate and describe more than one method to solve problems;
5. use whole numbers, simple fractions, and money amounts to quantify, label, measure, and locate numerical information;
6. represent real-life situations mathematically;
7. represent patterns using words, pictures, and numbers; and
8. use lists or diagrams to solve counting and arrangement problems.

Mathematical Applications

Number Sense - Intermediate

Purpose: Use numbers, language, and symbols to represent information, solve problems and justify reasoning

- A. A student shall demonstrate an understanding of:
1. the place-value structure of the base-ten number system;
 2. various meanings of and approaches to multiplication and division of whole numbers;
 3. the effects of multiplying and dividing whole numbers; and
 4. fractions as parts of unit wholes, as parts of a collection, as locations on number lines, and as divisions of whole numbers.
- B. A student shall demonstrate the ability to:
1. represent, order, and compare whole numbers and decimals;
 2. fluently add, subtract, multiply, and divide whole numbers;
 3. develop and use strategies to estimate the results of whole number computations and to judge the reasonableness of such results;
 4. select and use appropriate methods and tools for computing with whole numbers from among mental computation, estimation, calculators, and paper and pencil according to the context and nature of the problem;
 5. model problem situations with objects and use representations including tables, graphs, and equations to draw conclusions;
 6. describe and extend patterns, make generalizations, and draw conclusions about them; and
 7. solve a variety of single- and multiple-step problems using number relationships and properties, number patterns, and computation and estimation strategies.

Current Standard:
Mathematical Concepts and Applications
Chance and Data Handling - Intermediate

A student shall:

1. demonstrate understanding of how to find range, mean, and median simple concepts of likelihood including impossible, unlikely, equal chance, likely, certain, fair, and unfair; and information displayed in graphs, tables, and charts;
2. answer questions by collecting and organizing data, representing data, and communicating results;
3. conduct experiments involving uncertainty including listing possible outcomes; tally, record, and explain results; and use the results to predict future outcomes;
4. describe patterns, trends, or relationships in data displayed in graphs, tables, or charts; and
5. represent data using at least two graphic forms.

Mathematical Concepts and Applications
Chance and Data - Intermediate

Purpose: Describe and compare the likelihood of events, and collect, organize and represent data to answer questions

- A. A student shall demonstrate an understanding of:
1. Data
 - a. measures of center, focusing on the median.
 2. Chance
 - a. data representations including line plots, bar graphs, and line graphs; and
 - b. terms used to convey that some events are certain to occur, others are certain not to occur, and others may or may not occur.
- B. A student shall demonstrate the ability to:
1. Data
 - a. design an investigation to address a question;
 - b. collect data using observations, surveys, and experiments;
 - c. organize and represent data using tables and graphs;
 - d. propose and justify conclusions and predictions based on data;
 - e. describe the shape and important features of a set or data and compare related data sets, with an emphasis on how the data are distributed; and
 - f. compare different representations of the same data and evaluate how well each representation shows important aspects of data.
 2. Chance
 - a. determine the degree of likelihood of an event using terminology, for example, certain, likely, equally likely, unlikely, and impossible; and
 - b. predict the probability of an outcome of a simple experiment and test the prediction.

Current Standard:

Mathematical Concepts Applications

Space, Shape and Measurement – Middle School

A student will...

1. demonstrate understanding of basic concepts of coordinate systems, know precise mathematical names and properties of two- and three-dimensional shapes, convert common measurement units within the metric system and customary systems, and understand how properties of shapes affect stability and rigidity of objects;
2. recognize and describe shape, size, and position of two- and three-dimensional objects and the images of the objects under transformations;
3. create complex designs using transformations and tilings to generalize properties of shapes;
4. connect geometric concepts and use them to test conjectures and solve problems, including distances (rational and irrational), the Pythagorean Theorem, similarity and congruence, slope, properties of polygons and polyhedra, and symmetry;
5. measure length, mass, perimeter, and area of quadrilaterals and circles, surface area and volume of solids and angles, including determining type of measurement (exact, approximate, derived), selecting appropriate measurement tools and units, and measuring to the appropriate accuracy; and
6. describe how changes in the dimensions of figures affect perimeter, area, and volume.

Mathematical Concepts and Applications

Shape, Space and Measurement – Middle School

Purpose: Use concepts of shape and measurement as analytical tools by developing definitions, testing conjectures, and applying measurement and proportional reasoning skills

- A. A student shall demonstrate an understanding of:
1. Shape and Space
 - a. basic concepts of coordinate systems; and
 - b. precise mathematical names and properties of two- and three-dimensional shapes.
 2. Measurement
 - a. the relationships among units and conversion from one measurement unit to another within the same system.
- B. A student shall demonstrate the ability to:
1. Shape and Space
 - a. precisely describe, classify, and understand relationships among types of 2- and 3-dimensional objects using their defining properties, for example, angle size, number of sides or vertices, parallel faces, and congruent sides;
 - b. describe the shape, size, position, and orientation of geometric figures under informal transformations, including flips, turns, slides, and scaling;
 - c. analyze and describe shapes, symmetries, and tilings in art forms from various cultures;
 - d. apply geometric concepts and relationships to test conjectures and solve problems involving congruence, similarity, the Pythagorean Theorem, and coordinate systems; and
 - e. use visual tools, for example, networks or vertex-edge graphs to model and solve problems.

2. Measurement

- a. understand, select, and use units of appropriate size and type to measure angles, perimeter, area, surface area, and volume;
- b. select and apply techniques and tools to accurately find length, area, surface area, volume, and angle measures to appropriate levels of precision;
- c. develop and use formulas to determine the circumference of circles and the area of triangles, quadrilaterals, and circles; and
- d. apply a scale factor to the linear dimensions of a shape and describe the resulting changes to the shape's angles, perimeter, area, and volume.

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Current Standard:**Mathematical Concepts and Applications****Number Sense – Middle School**

A student shall:

1. demonstrate understanding of number concepts including place value, exponents, prime and composite numbers, multiples, and factors; fractions, decimals, percents, integers, and numbers in scientific notation by translating among equivalent forms; and compare and order numbers within a set;
2. solve a variety of problems by representing numbers efficiently, selecting appropriate operations, selecting appropriate methods to estimate or compute, and generating and describing more than one method to solve problems;
3. analyze and justify operations and methods used and evaluate the reasonableness of computed results to problems with proposed solutions;
4. apply proportional reasoning to solve a variety of problems using rates, ratios, proportions, and percents; and
5. create a real-world communication that demonstrates the ability to use a variety of numbers in context.

Mathematical Applications**Number Sense-Middle School**

Purpose: Use rational number concepts, relationships, and computational methods to represent information, solve problems, and justify reasoning

- A. A student shall demonstrate an understanding of:
1. number concepts including place value, prime and composite numbers, and multiples and factors;
 2. ways of representing fractions, decimals, percents, and integers;
 3. the meaning and effects of arithmetic operations with fractions, decimals, and integers;
 4. exponential, scientific, and calculator notation to represent large and small numbers; and
 5. the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots.
- B. A student shall demonstrate the ability to:
1. compare and order fractions, decimals, percents, and integers, and translate among equivalent representations of numbers;
 2. fluently add, subtract, and multiply using fractions, decimals, and integers;
 3. use the inverse relationships of addition and subtraction, multiplication and division, and squaring and finding square roots to simplify computations and solve problems;
 4. solve a variety of problems by representing rational numbers efficiently, selecting and using appropriate operations and methods to estimate or compute, and generating and describing more than one solution method;
 5. use factors, multiples, prime factorization, and relatively prime numbers to solve problems; and
 6. apply proportional reasoning to solve a variety of problems using rates, ratios, proportions, and percents.

Current Standard:

Mathematical Concepts and Applications

Chance and Data Handling – Middle Level

A student shall:

1. calculate basic measures of center and variability, to demonstrate understanding of basic concepts of probability and calculate simple probabilities;
2. formulate a question and design an appropriate data investigation;
3. organize raw data and represent it in more than one way;
4. analyze data by selecting and applying appropriate data measurement concepts;
5. critique various representations of data;
6. devise and conduct a simulated probability situation; and
7. predict future results based on experimental results.

Mathematical Concepts and Applications

Chance and Data – Middle Level

Purpose: Use rational numbers to quantify probabilities and use data analysis to answer questions and make predictions

A. A student shall demonstrate an understanding of:

1. Data
 - a. measures of center, focusing on the mean;
 - b. measures of spread, focusing on the interquartile range; and
 - c. graphs of data including histograms, stem-and-leaf plots, box plots, scatterplots, and circle graphs.
2. Chance
 - a. probability terminology including randomness, event, sample space, and outcome; and
 - b. how the likelihood of an event can be expressed using a number from 0 to 1.

B. A student shall demonstrate the ability to:

1. Data
 - a. formulate a question, design a study, and collect data to answer the question;
 - b. select, create, and use appropriate graphical representations of data;
 - c. find, use, and interpret measures of center and spread;
 - d. identify trends in data collected over time and differences across various populations; and
 - e. summarize or critique data investigations done by others.
2. Chance
 - a. use strategies to determine the outcome of a chance event including organized lists, tree diagrams, and area models;
 - b. conduct a probability experiment to simulate a real life issue involving uncertainty; and

- c. use the results of a probability simulation to make a prediction, recommendation, or decision.

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Current Standard:

Mathematical Concepts and Applications

Patterns and Functions – Middle School

A student shall:

1. analyze patterns and use concepts of algebra to represent mathematical relationships, including demonstrating understanding of the concepts of variables, expressions, and equations;
2. recognize, analyze, and generalize patterns found in linear and nonlinear phenomena; data from lists, graphs, and tables; number theory; sequences; rational numbers; and formulas;
3. represent and interpret cause and effect relationships using algebraic expressions, equations and inequalities, tables and graphs, verbal descriptions, and spread sheets;
4. connect verbal, symbolic, and graphical representations; identify constraints; translate algebraic expressions into equivalent forms; and propose and justify solutions in problem situations; and
5. use properties of mathematics to informally justify reasoning in a logical argument.

Mathematical Applications

Algebra - Middle School

Purpose: Analyze mathematical patterns, relationships, and functions to model and solve problems

A. A student shall demonstrate an understanding of:

1. patterns, relations, and functions;
2. how verbal descriptions, tables, graphs, and equations can be used to describe patterns of change in real-world situations;
3. the similarities and differences between the properties of linear and nonlinear functions; and
4. equivalent forms for simple algebraic expressions.

B. A student shall demonstrate the ability to:

1. recognize, analyze, and generalize patterns and build mathematical models to make decisions or formulate predictions;
2. predict patterns of change in real-world situations using verbal descriptions, tables, graphs, and equations;
3. classify linear, exponential, and quadratic functions and contrast their properties using tables, graphs, and equations;
4. recognize relationships between symbolic expressions and graphs of lines, paying particular attention to the meaning of intercept and slope;
5. generate equivalent forms for simple algebraic expressions and solve multiple step linear equations; and
6. use graphing calculator technology to determine solutions to linear, exponential, and quadratic equations.

**Current Standard: Mathematical Concepts and Applications
Shape, Space and Measurement - High School**

A student shall:

- A. demonstrate understanding of the characteristics of geometric figures in both two and three dimensions, including reflections, rotations, and translations; congruence and similarity; perimeter, area, and volume; distance; scaling; and symmetry;
- B. use spatial visualization to model geometric structures and solve problems;
- C. analyze characteristics of shape, size, and space in art, architecture, design, or nature;
- D. translate between numerical relationships and geometric representations to analyze problem situations, scale models, or measurement;
- E. use properties of shape, location, or measurement to justify reasoning in a logical argument; and
- F. demonstrate understanding of measurement accuracy, error, and tolerances.

**Mathematical Concepts and Applications
Shape, Space and Measurement - High School**

Purpose: Develop capacity to reason about space, shape, and measurement in increasingly abstract ways

- A. A student shall demonstrate an understanding of:
 - 1. Shape and Space
 - a. reflections, rotations, translations, and scaling of two-dimensional figures; and
 - b. congruence and similarity.
 - 2. Measurement
 - a. perimeter, area, surface area, and volume; and
 - b. distance on a coordinate plane.
- B. A student shall demonstrate the ability to:
 - 1. Shape and Space
 - a. use visualization, spatial reasoning, and geometric modeling to solve problems;
 - b. construct and model two- and three-dimensional figures from various points of view using appropriate tools and technologies, for example ruler, protractor, interactive geometric software, isometric drawing paper, computer aided design;
 - c. analyze characteristics of shape, size, and space as used in art, architecture, design or nature;
 - d. use geometric models to represent and explain numerical relationships or measurement problems;
 - e. investigate conjectures and solve problems involving two- and three-dimensional objects represented with Cartesian coordinates; and
 - f. make and test conjectures, and solve problems involving the congruence and similarity of two-dimensional figures.

2. Measurement

- a. analyze precision, accuracy, and approximate error in measurement situations; and
- b. generalize a scale factor to the dimensions of a shape and describe the resulting changes to the shape's perimeter, area, surface area, and volume.

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Current Standard:
Mathematical Concepts and Applications
Chance and Data Analysis – High School

A student shall:

- A. demonstrate understanding of the statistical concepts of measures of center, variability, and rank; differences between correlation and causation; sampling procedures; line or curve of best fit; and concepts related to uncertainty of randomness, permutations, combinations, and theoretical and experimental probabilities;
- B. investigate a problem of significance by formulating a complex question, designing a statistical study, collecting data, representing data appropriately, using appropriate statistics to summarize data, determining whether additional data and analysis are necessary, drawing conclusions based on data, and communicating the results appropriately for the intended audience;
- C. analyze and evaluate the statistical design, survey procedures, and reasonableness of mathematical conclusions in a published study or article;
- D. use probability experiments, simulations, or theory to model situations involving uncertainty; and make predictions based on the model.

Mathematical Concepts and Applications
Chance and Data – High School

Purpose: Apply concepts of chance and data analysis to make critical judgements, predictions, or decisions

- A. A student shall demonstrate an understanding of:
 1. Data
 - a. differences among various kinds of statistical studies and which inferences can legitimately be drawn from each;
 - b. the difference between correlation and causation; and
 - c. characteristics of a well-designed study, including the role of randomization, appropriateness of data analysis, and validity of conclusions.
 2. Chance
 - a. how to compute the probability of a compound event;
 - b. concepts of conditional probability and independent events; and
 - c. concepts of sample space and probability distribution for simple cases.
- B. A student shall demonstrate the ability to:
 1. Data
 - a. independently formulate a question, design a study, collect data, and report results and conclusions using technology, data displays, and statistical measures;
 - b. evaluate a published report containing data by examining the design of the study, the appropriateness of data analysis, and the validity of conclusions;
 - c. display bivariate data using a scatterplot and describe the shape of the data; and

- d. analyze data by applying tools to find the line or curve of best fit and appropriate summary statistics, for example, correlation coefficient or regression equation, to make decisions.
2. Chance
 - a. compute the probability of a compound event using both theoretical and experimental probability;
 - b. compute and interpret the expected value of a random variable in simple cases;
 - c. use sample spaces and probability distributions to determine the probability of events in simple cases; and
 - d. use simulations to construct empirical probability distributions.

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Current Standard:

Mathematical Concepts and Applications

Algebraic Patterns- High School

A student shall demonstrate the ability to identify rates of change in different models of linear relationships and know characteristics of polynomial, exponential, and periodic functions and relations; functional notation; and terminology by:

- A. translating between real-world situations and mathematical models using graphs; matrices; data tables, spread sheets, or both; verbal descriptions; and algebraic expressions;
- B. generalizing patterns and building mathematical models to describe and predict real situations including linear, exponential growth and decay, and periodic;
- C. using algebraic concepts and processes to represent and solve problems involving variable quantities; and
- D. using properties of algebra to justify reasoning using a logical argument.

Mathematical Concepts and Applications

Algebra - High School

Purpose: Represent and analyze quantitative situations using classes of functions, rates of change, and algebraic symbols and processes

- A. A student shall demonstrate an understanding of:
 - 1. relations and functions;
 - 2. properties of classes of functions, including exponential, polynomial, and periodic functions; and
 - 3. equivalent forms of expressions, equations, inequalities, and relations.
- B. A student shall demonstrate the ability to:
 - 1. approximate and interpret rates of change from graphical and numerical data;
 - 2. analyze functions of two variables by investigating rates of change, intercepts, zeros, and asymptotes;
 - 3. identify essential quantitative relationships in a situation and determine the class or classes of functions that might model the relationships;
 - 4. represent and explain mathematical relationships with graphs, tables, spreadsheets, and equations, using both technology and paper and pencil;
 - 5. fluently use multiple representations of a given mathematical relationship;
 - 6. use matrices to represent data and solve systems of equations;
 - 7. generalize patterns and build mathematical models to describe and analyze real situations including linear, exponential, and periodic; and
 - 8. solve equations, inequalities, and systems of equations with fluency – mentally or with paper and pencil in simple cases and using technology in all cases – and justify the solutions.

Current Standard:

Mathematical Concepts and Applications

Discrete Mathematics- High School

A student shall use discrete structures to demonstrate mathematical relationships and solve problems by:

- A. describing the difference between discrete and continuous models of data and permutations, combinations, and other principles of systematic counting;
- B. translating between real-world situations and discrete mathematical models using vertex-edge graphs, matrices, verbal descriptions, and sequences;
- C. analyzing and modeling iterative and recursive patterns;
- D. analyzing and solving problems by building discrete mathematical models, developing and comparing algorithms or sequences of procedures, and determining whether solutions exist, the number of possible solutions, and the best solutions; and
- E. using properties of mathematics to justify reasoning in a logical argument.

Mathematical Concepts and Applications

Discrete Mathematics - High School

Purpose: Use discrete structures to represent, model, and interpret physical, social and mathematical phenomena

- A. A student shall demonstrate an understanding of:
 - 1. counting techniques, including the multiplication principle, permutations, and combinations.
- B. A student shall demonstrate the ability to:
 - 1. investigate and apply systematic counting techniques, set relationships, and principles of logic to represent, analyze, and solve problems;
 - 2. use charts, vertex-edge graphs, and matrices to model and solve problems and draw reasonable conclusions about the situation being modeled;
 - 3. explore, develop, and analyze algorithmic thinking to accomplish a task or solve a problem;
 - 4. use symbolic expressions including iterative and recursive forms to represent relationships arising from various contexts; and
 - 5. how to generalize patterns using explicitly and recursively defined functions.

Current Standard:
Mathematical Concepts and Applications
Technical Applications- High School

A student shall:

- A. demonstrate knowledge of computational technologies; how to use complex measurement equipment for several systems; how to convert between measuring systems; how to measure to scale; how to calculate quantities using algebraic formulas; how to read and interpret information in complex graphs, tables, and charts; scientific and exponential notation used in complex systems; trigonometric applications appropriate to technical situations; and fundamental geometric constructions or calculations used in drafting or construction;
- B. create a set of plans to design or modify a complex structure, product, or system by researching background information, calculating mathematical specifications, and developing a materials list that matches mathematical specifications;
- C. construct a complex structure, product, or model to mathematical specifications; and
- D. analyze existing complex structure, product, or system for purposes of maintenance, repair, trouble shooting, or optimizing function

Mathematical Concepts and Applications
Technical Applications- High School

Purpose: Apply mathematics to solve technical problems

- A. A student shall demonstrate an understanding of:
 - 1. computational technologies;
 - 2. scientific and exponential notation used in complex systems;
 - 3. trigonometric applications appropriate to technical situations; and
 - 4. fundamental geometric constructions or calculations used in drafting or construction.
- B. A student shall demonstrate the ability to:
 - 1. use complex measurement equipment for several systems;
 - 2. convert between measuring systems;
 - 3. measure to scale;
 - 4. calculate quantities using algebraic formulas;
 - 5. read and interpret information in complex graphs, tables, and charts;
 - 6. create a set of plans to design or modify a complex structure, product, or system by researching background information, calculating mathematical specifications, and developing a materials list that matches mathematical specifications;
 - 7. construct a complex structure, product, or model to mathematical specifications; and
 - 8. analyze an existing complex structure, product, or system for purposes of maintenance, repair, trouble shooting, or optimizing function.