Honors Algebra II Curriculum

This curricula and accompanying instructional materials have been developed to align with the NJSLS and in accordance with the NJ Department of Education's guidelines to include: Curriculum designed to meet grade level expectations, integrated accommodations and modifications for students with IEPs, 504s, ELLs, and gifted and talented students, assessments including benchmarks, formative, summative, and alternative assessments, a list of core instructional and supplemental materials, pacing guide, interdisciplinary connections, integration of 21st century skills, integration of technology, and integration of 21st Century Life and Career standards.

About the Standards

In 1996, the New Jersey State Board of Education adopted the state's first set of academic standards called the Core Curriculum Content Standards. The standards described what students should know and be able to do upon completion of a thirteen-year public school education. Over the last twenty years, New Jersey's academic standards have laid the foundation for local district curricula that is used by teachers in their daily lesson plans.

Revised every five years, the standards provide local school districts with clear and specific benchmarks for student achievement in nine content areas. Developed and reviewed by panels of teachers, administrators, parents, students, and representatives from higher education, business, and the community, the standards are influenced by national standards, research-based practice, and student needs. The standards define a "Thorough and Efficient Education" as guaranteed in 1875 by the New Jersey Constitution. Currently the standards are designed to prepare our students for college and careers by emphasizing high-level skills needed for tomorrow's world.

The New Jersey Student Learning Standards include Preschool Teaching and Learning Standards, as well as nine K-12 standards for the following content areas: **21st Century Life and Careers, Comprehensive Health and Physical Education, English Language Arts, Mathematics, Science, Social Studies, Technology, Visual and Performing Arts, World Languages**

The most recent review and revision of the NJSLS standards occurred in 2023, and these were to be implemented starting in the Fall of 2024.

Interdisciplinary Connections

L.11-12.6. Acquire and use accurate general academic and domain-specific words and phrases, sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

Integration of Technology

9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.).

9.4.12.TL.2: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data

9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments. • 9.4.12.TL.4: Collaborate in online learning communities or social networks or virtual worlds to analyze and propose a resolution to a real-world problem (e.g., 7.1.AL.IPERS.6).

21st Century Skills

9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).

9.4.12.CI.2: Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).

9.4.12.CI.3: Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).

9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

9.4.12.CT.3: Enlist input from a variety of stakeholders (e.g., community members, experts in the field) to design a service learning activity that addresses a local or global issue (e.g., environmental justice).

9.4.12.CT.4: Participate in online strategy and planning sessions for course-based, school-based, or other project and determine the strategies that contribute to effective outcomes.

9.4.12.DC.1: Explain the beneficial and harmful effects that intellectual property laws can have on the creation and sharing of content (e.g., 6.1.12.CivicsPR.16.a).

9.4.12.DC.2: Compare and contrast international differences in copyright laws and ethics.

9.4.12.DC.3: Evaluate the social and economic implications of privacy in the context of safety, law, or ethics (e.g., 6.3.12.HistoryCA.1).

9.4.12.DC.4: Explain the privacy concerns related to the collection of data (e.g., cookies) and generation of data through automated processes that may not be evident to users (e.g., 8.1.12.NI.3).

9.4.12.DC.5: Debate laws and regulations that impact the development and use of software.

9.4.12.DC.6: Select information to post online that positively impacts personal image and future college and career opportunities.

9.4.12.DC.7: Evaluate the influence of digital communities on the nature, content and responsibilities of careers, and other aspects of society (e.g., 6.1.12.CivicsPD.16.a).

9.4.12.DC.8: Explain how increased network connectivity and computing capabilities of everyday objects allow for innovative technological approaches to climate protection.

9.4.12.GCA.1: Collaborate with individuals to analyze a variety of potential solutions to climate change effects and determine why some solutions (e.g., political. economic, cultural) may work better than others (e.g., SL.11-12.1., HS-ETS1-1, HS-ETS1-2, HS-ETS1-4, 6.3.12.GeoGI.1, 7.1.IH.IPERS.6, 7.1.IL.IPERS.7, 8.2.12.ETW.3).

9.4.12.IML.1: Compare search browsers and recognize features that allow for filtering of information. •
9.4.12.IML.2: Evaluate digital sources for timeliness, accuracy, perspective, credibility of the source, and relevance of information, in media, data, or other resources (e.g., NJSLSA.W8, Social Studies Practice: Gathering and Evaluating Sources.

9.4.12.IML.3: Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8)

9.4.12.IML.4: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience (e.g., S-ID.B.6b, HS-LS2-4).

9.4.12.IML.5: Evaluate, synthesize, and apply information on climate change from various sources appropriately (e.g., 2.1.12.CHSS.6, S.IC.B.4, S.IC.B.6, 8.1.12.DA.1, 6.1.12.GeoHE.14.a, 7.1.AL.PRSNT.2).

9.4.12.IML.6: Use various types of media to produce and store information on climate change for different purposes and audiences with sensitivity to cultural, gender, and age diversity (e.g., NJSLSA.SL5).

9.4.12.IML.7: Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change (e.g., NJSLSA.W1, 7.1.AL.PRSNT.4).

9.4.12.IML.8: Evaluate media sources for point of view, bias, and motivations (e.g., NJSLSA.R6, 7.1.AL.IPRET.6).

9.4.12.IML.9: Analyze the decisions creators make to reveal explicit and implicit messages within information and media (e.g., 1.5.12acc.C2a, 7.1.IL.IPRET.4).

Career Education

9.2.12.CAP.1: Analyze unemployment rates for workers with different levels of education and how the economic, social, and political conditions of a time period are affected by a recession. • 9.2.12.CAP.2: Develop college and career readiness skills by participating in opportunities such as structured learning experiences, apprenticeships, and dual enrollment programs.
9.2.12.CAP.3: Investigate how continuing education contributes to one's career and personal growth.
9.2.12.CAP.4: Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
9.2.12.CAP.5: Assess and modify a personal plan to support current interests and postsecondary plans.
9.2.12.CAP.6: Identify transferable skills in career choices and design alternative career plans based on those skills.
9.2.12.CAP.7: Use online resources to examine licensing, certification, and credentialing requirements at the local, state, and national levels to maintain compliance with industry requirements in areas of career interest.
9.2.12.CAP.8: Determine job entrance criteria (e.g., education credentials, math/writing/reading comprehension tests, drug tests) used by employers in various industry sectors.
9.2.12.CAP.9: Locate information on working papers, what is required to obtain them, and who must sign them.
9.2.12.CAP.10: Identify strategies for reducing overall costs of postsecondary education (e.g., tuition assistance, loans, grants, scholarships, and student loans).
9.2.12.CAP.11: Demonstrate an understanding of Free Application for Federal Student Aid (FAFSA) requirements to apply for postsecondary education.
9.2.12.CAP.12: Explain how compulsory government programs (e.g., Social Security, Medicare) provide insurance against some loss of income and benefits to eligible recipients.
9.2.12.CAP.13: Analyze how the economic, social, and political conditions of a time period can affect the labor market.
9.2.12.CAP.14: Analyze and critique various sources of income and available resources (e.g., financial assets, property, and transfer payments) and how they may substitute for earned income.
9.2.12.CAP.15: Demonstrate how exemptions, deductions, and deferred income (e.g., retirement or medical) can reduce taxable income.
9.2.12.CAP.16: Explain why taxes are withheld from income and the relationship of federal, state, and local taxes (e.g., property, income, excise, and sales) and how the money collected is used by local, county, state, and federal governments.
9.2.12.CAP.17: Analyze the impact of the collective bargaining process on benefits, income, and fair labor practice.
9.2.12.CAP.18: Differentiate between taxable and nontaxable income from various forms of employment (e.g., cash business, tips, tax filing and withholding).
9.2.12.CAP.19: Explain the purpose of payroll deductions and why fees for various benefits (e.g., medical benefits) are taken out of pay, including the cost of employee benefits to employers and self-employment income.
• 9.2.12.CAP.20: Analyze a Federal and State Income Tax Return.
9.2.12.CAP.21: Explain low-cost and low-risk ways to start a business.
9.2.12.CAP.22: Compare risk and reward potential and use the comparison to decide whether starting a business is feasible.
9.2.12.CAP.23: Identify different ways to obtain capital for starting a business.

Content Area: Mathematics	
Course Title: Honors Algebra II	**Grade level: 10-12**
Unit 1: Complex Solutions and Modeling with Rational Exponents	**September - December**
Unit 2: Polynomials and Analysis of Nonlinear Functions	**January - April**
Unit 3: Periodic Models and the Unit Circle	**May**
Unit 4: Probability	**May**
Unit 5: Matrices	**June**
Date Created: 8/13/25	BOE Approved on:

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum
Unit 1 Overview

Content Area: Mathematics

Unit Title: Complex Solutions and Modeling with Rational Exponents

Target Course/Grade Level:10-12

Unit Summary:

In Unit 1:

- Perform arithmetic operations with complex numbers
- Use complex numbers in polynomial identities and equations
- Build a function that models a relationship between two quantities
- Construct & compare linear, quadratic, & exponential models
- Write expressions in equivalent forms to solve problems
- Extend the properties of exponents to rational exponents
- Analyze functions using different representations

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
F.BF.A.2	Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
A.SSE.B.4	Derive and/or explain the derivation of the formula for the sum of a finite geometric series (when the common ratio is not 1), and use the formula to solve problems. For example, calculate mortgage payments.
N.RN.A.1	Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5(^{1/3})^3$ to hold, so $(5^{1/3})^3$ must equal 5.
N.RN.A.2	Rewrite expressions involving radicals and rational exponents using the properties of exponents
A.SSE.B.3	Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression
A.SSE.B.3c	Use the properties of exponents to transform expressions for exponential functions. For example the expression 1.15^t can be rewritten as $(1.15^{1/12})^{12t}$ $\approx 1.012^{12t}$ to reveal the approximate equivalent monthly interest rate if the annual rate is 15%

Unit Enduring Questions:	**Unit Enduring Understandings:**
● What is the difference between an arithmetic and geometric sequence? ● Explain the process of rewriting expressions containing rational expressions into radical form? ● Describe the property of exponents being used to simplify given exponential functions?	● Add, subtract, and multiply complex numbers using the commutative, associative and distributive properties. ● Solve quadratic equations with real coefficients that have complex solutions by taking square roots, completing the square and factoring. ● Solve simple systems consisting of a linear and quadratic equation in two variables algebraically and graphically. ● Solve algebraically a system of three linear equations. ● Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms. ● Use the formula for the sum of a finite geometric series to solve problems [*for example, calculate mortgage payments*; derive the formula for the sum of a finite geometric series (when the common ratio is not 1)]. ● Use properties of integer exponents to explain and convert between expressions involving radicals and rational exponents. ● *Use the properties of exponents to transform expressions for exponential functions, explain properties of the quantity revealed in the transformed expression or different properties of the function.* ● *Express as a logarithm the solution to* $ab^{ct} = d$ *where a, c, and d are numbers and the base b is 2, 10, or e; evaluate the logarithm*

Unit Objectives: ***Students will know….***	**Unit Objectives:** ***Students will be able to…...***
• Recursion • Series as a sum of a sequence • derive or explain the derivation of the formula for the sum of a finite geometric series. • use the formula for the sum of a finite geometric series to solve problems. • Alternate, equivalent forms of an exponential expression containing rational exponents may reveal specific attributes of the function that it defines. • Exponents and logarithms have an inverse relationship. • Solutions to an exponential equation in one variable can be written as a logarithm.	• distinguish between recursive and explicit formulas. • represent geometric and arithmetic sequences recursively. • represent geometric and arithmetic sequences with explicit formulas. • translate between recursive form and explicit form of geometric and arithmetic sequences. • recognize explicit formula for geometric sequences as exponential functions containing a domain in the integers only. • interpret the parameters of an exponential function representing a geometric sequence. • interpret the parameters of a linear function representing an arithmetic sequence. • derive or explain the derivation of the formula for the sum of a finite geometric series. • use the formula for the sum of a finite geometric series to solve problems. • derive or explain the derivation of the formula for the sum of a finite geometric series. • use the formula for the sum of a finite geometric series to solve problems. • rewrite expressions containing rational exponents into radical form. • rewrite expressions containing radical notation into exponential expressions containing rational exponents. • use properties of exponent transform/rewrite an exponential expression for an exponential function. • explain the properties of the quantity or the function. • transform an exponential model represented by $ab^{ct} = d$ where a, c, and d are numbers and the base b is 2, 10, or e. • write the solution to $ab^{ct} = d$ as a logarithm. • use technology to evaluate logarithms having base 2, 10, or e

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum
Unit 2 Overview

Content Area: Mathematics

Unit Title: Polynomial and Analysis of Nonlinear Functions

Target Course/Grade Level: 10-12

Unit Summary:

In Unit 2:

- Understand the relationship between zeros and factors of polynomials
- Interpret the structure of expressions
- Use polynomial identities to solve problems
- Analyze functions using different representations
- Rewrite rational expressions
- Understand solving equations as a process of reasoning and explain the reasoning
- Interpret functions in terms of the context
- Translate between the geometric description and the equation for a conic section
- Represent and solve equations and inequalities graphically

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
A.APR.B.2	Know and apply the Remainder Theorem: For a polynomial p(x) and a number a, the remainder on division by x – a is p(a), so p(a) = 0 if and only if (x – a) is a factor of p(x).
A.SSE.A.2	Use the structure of an expression to identify ways to rewrite it. For example, see $x^4 – y^4$ as $(x^2)^2 – (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 – y^2)(x^2 + y^2)$.
A.SSE.B.3	Identify zeros of polynomials when suitable factorizations are available, and use the zeros to construct a rough graph of the function defined by the polynomial.
A.REI.A.2	Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.
A.REI.A.1	Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
F.IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.B.6	Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph.
A,REI.D.11	Explain why the x-coordinates of the points where the graphs of the equations y = f(x) and y = g(x) intersect are the solutions of the equation f(x) = g(x); find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.*

Unit Enduring Questions:

- How do we solve simple rational and radical equations in one variable, use them to solve problems and show how extraneous solutions may arise. ?
- For radical functions, how do we interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship?
- How do we derive the equation of a parabola given a focus and directrix?

Unit Enduring Understandings:

- Apply the Remainder Theorem in order to determine the factors of a polynomial.
- Use an appropriate factoring technique to factor polynomials. Explain the relationship between zeros and factors of polynomials, and use the zeros to construct a rough graph of the function defined by the polynomial.
- Graph polynomial functions from equations; identify zeros when suitable factorizations are available; show key features and end behavior.
- Use polynomial identities to describe numerical relationships and prove polynomial identities.
- Rewrite simple rational expressions in different forms using inspection, long division, or, for the more complicated examples, a computer algebra system.
- Solve simple rational and radical equations in one variable, use them to solve problems and show how extraneous solutions may arise. Create simple rational equations in one variable and use them to solve problems.
- For radical functions, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship
- Derive the equation of a parabola given a focus and directrix.
- Graph logarithmic functions expressed symbolically and show key features of the graph (including intercepts and end behavior).
- Find approximate solutions for f(x)=g(x), using technology to graph, make tables of values, or find successive approximations. Include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, logarithmic and exponential functions.

Unit Objectives:

Students will know….

- Polynomial division: For a polynomial $p(x)$ and a number a:

$p(a) = 0$ if and only if $(x – a)$ is a factor of $p(x)$

$(x – a)$ is a factor of $p(x)$ if and only if $p(a) = 0$

- Factors of polynomials can be used to identify zeros to be used to develop a rough graph of the polynomial function.
- Factors of polynomials can be used to identify zeros to be used to develop a rough graph of the polynomial function.
- Polynomial identities can be used to describe numerical relationships.
- Rational expressions can be written in different forms.
- Inverse relationships exist between roots and powers.
- Extraneous solutions do not result in true statements.
- A radical function is any function that contains a variable inside a root.
- Any point on a parabola is equidistant between the focus and the directrix.
- Logarithmic functions
- Solutions to complex systems of nonlinear functions can be approximated graphically

Unit Objectives:

Students will be able to…...

- use the Remainder Theorem to determine factors of a polynomial.
- factor polynomials.
- analyze a table of values to determine where the polynomial is increasing and decreasing.
- use the zeros of the polynomial to create rough graph
- graph a polynomial function given its equation.
- identify zeros from the graph and using an appropriate factoring technique.
- show key features of the graph, including end behavior.
- use technology to graph and describe key features of the graph for complicated cases.
- show that the polynomial identity $(x^2 + y^2)^2 = (x^2 – y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.
- prove polynomial identities.
- write $a(x)/b(x)$ in the form $q(x) + r(x)/b(x)$, where $a(x)$, $b(x)$, $q(x)$, and $r(x)$ are polynomials with the degree of $r(x)$ less than the degree of $b(x)$.
- use inspection, factoring and long division to rewrite rational expressions.
- use technology to rewrite rational expressions for more complicated cases.
- use the inverse relationship between roots and powers when solving radical equations.
- identify any extraneous solutions.
- solve simple rational equations in one variable (degree of numerators and denominator is not greater than 2).
- write simple rational equations in one variable and use the rational equation to solve problems
- interpret key features of radical functions from graphs and tables in the context of the problem.
- sketch graphs of radical functions given a verbal description of the relationship between the quantities.
- identify intercepts and intervals where function is increasing/decreasing.
- determine the practical domain of a radical function.
- determine key features including intercepts; intervals where the function is increasing, decreasing, positive, or

	negative; relative maxima and minima; symmetries; end behavior. ● use the distance formula to write an equation of a parabola when the focus and directrix are given. ● graph logarithmic functions having base 2, 10 or e, using technology for more complicated cases. ● show intercepts and end behavior of logarithmic functions. ● find the solution to f(x)=g(x) approximately, e.g., using technology to graph the functions; include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions. ● find the solution to f(x)=g(x) approximately, e.g., using technology to make tables of values, or find successive approximations; include cases where f(x) and/or g(x) are linear, polynomial, rational, absolute value, exponential, and logarithmic functions.

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum
Unit 3 Overview

Content Area: Mathematics

Unit Title: Periodic Models and the Unit Circle

Target Course/Grade Level: 10 - 12

Unit Summary:

In Unit 3:

- Extend the domain of trigonometric functions using the unit circle
- Analyze functions using different representations
- Interpret functions that arise in applications in terms of the context
- Model periodic phenomena with trigonometric functions
- Prove and apply trigonometric identities
- Summarize, represent, and interpret data on two categorical and quantitative variables
- Build a function that models a relationship between two quantities
- Build new functions from existing functions

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
F.IF.B.4	For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship.
F.BF.A.1	Write a function that describes a relationship between two quantities.
F.IF.C.9	Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
F.IF.C.7	Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
F.TF.A.1	Understand radian measure of an angle as the length of the arc on the unit circle subtended by the angle.
F.TF.A.2	Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle

Unit Enduring Questions:	**Unit Enduring Understandings:**
● How do I graph a trigonometric function by hand and with the use of technology (showing period, midline, and amplitude)? ● What are the key features of the graph: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity. ● What is the radian measure of an angle? ● What is the unit circle and how can we use it?	● Graph trigonometric functions expressed symbolically, showing key features of the graph, by hand in simple cases and using technology for more complicated cases. ● Construct a function that combines, using arithmetic operations, standard function types to model a relationship between two quantities. ● Use the radian measure of an angle to find the length of the arc in the unit circle subtended by the angle and find the measure of the angle given the length of the arc. ● Explain how the unit circle in the coordinate plane enables the extension of trigonometric functions to all real numbers, interpreted as radian measures of angles traversed counterclockwise around the unit circle.

Unit Objectives: ***Students will know….***	**Unit Objectives:** ***Students will be able to…...***
● Relationship between the unit circle in the coordinate plane and graph of trigonometric functions. ● Functions of various types can be combined to model real world situations. ● Radian measure of an angle as the length of the arc on the unit circle that is subtended by the angle ● Relationship between degrees and radians ● Relationship between the unit circle in the coordinate plane and graph of trigonometric functions.	● graph trigonometric functions, showing period, midline, and amplitude. ● use arithmetic operations to combine functions of varying types in order to model relationships between quantities. ● find the measure of the angle given the length of the arc. ● find the length of an arc given the measure of the central angle. ● convert between radians and degrees. use the unit circle to evaluate sine, cosine and tangent of standard reference angles. ● graph trigonometric functions, showing period, midline, and amplitude.

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum
Unit 4 Overview

Content Area: Mathematics

Unit Title: Probability

Target Course/Grade Level: 10-12

Unit Summary:

In Unit 4:

- Summarize, represent, and interpret data on a 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
- Understand the 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

Learning Targets	
CPI #	**Cumulative Progress Indicators (CPI) for Unit**
S.IC.B.3	Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.
S.IC.B.4	Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling

Unit Enduring Questions:	**Unit Enduring Understandings:**
● What is the purpose of (and difference among) sample surveys, experiments, and observational studies? ● How does randomization relate to sample surveys, experiments, and observational studies? ● How do I use data from a sample survey to estimate a population mean or proportion?	● Identify the differences among and purposes of sample surveys, experiments, and observational studies, explaining how randomization relates to each. ● Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.
Unit Objectives: ***Students will know….*** ● Collecting data from a random sample of a population makes it possible to draw conclusions about the whole population. ● Randomly assigning individuals to different treatments allows a fair comparison of the effectiveness of those treatments. ● Sample surveys, experiments, and observational studies serve different statistical purposes allowing for different statistical analyses. ● Appropriately drawn samples of a population may be used to estimate a population mean or population proportion. ● Relationship between margin of error, variation with a data set, and variability in the population	**Unit Objectives:** ***Students will be able to…...*** ● distinguish between sample surveys, experiments, and observational studies. ● explain the importance of randomization in each of these processes. ● identify voluntary response samples and convenience samples. ● describe simple random samples, stratified random samples, and cluster samples. ● explain how under coverage, nonresponse, and question wording can lead to bias in a sample survey. ● conduct simulations of random sampling to gather samples. ● estimate population means with sample means. ● estimate population proportions with sample proportions. ● calculate margins of error for the estimates. ● explain how the results relate to variability in the population.

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum
Unit 5 Matrices

Content Area: Mathematics

Unit Title: Matrices

Target Course/Grade Level:10-12

Unit Summary:

In Unit 5:

- Students will be able to write the augmented matrix for a linear system.
- Students will be able to perform matrix row operations.
- Students will be able to use matrices and Gaussian elimination to solve systems.
- Students will be able to use matrices and Gauss Jordan elimination to solve systems.

Learning Targets

CPI #	Cumulative Progress Indicators (CPI) for Unit

Unit Enduring Questions:

- How can we write the augmented matrix for a linear system?
- How do we perform matrix row operations?
- How do we use matrices and Gaussian elimination to solve systems?
- How do we use matrices and Gauss Jordan elimination to solve systems

Unit Enduring Understandings:

- Students will be able to write the augmented matrix for a linear system.
- Students will be able to perform matrix row operations.
- Students will be able to use matrices and Gaussian elimination to solve systems.
- Students will be able to use matrices and Gauss Jordan elimination to solve systems.

Unit Objectives: ***Students will know….*** ● how to write the augmented matrix for a linear system. ● how to perform matrix row operations. ● how to use matrices and Gaussian elimination to solve systems. ● how to use matrices and Gauss Jordan elimination to solve systems.	**Unit Objectives:** ***Students will be able to…...*** ● to write the augmented matrix for a linear system. ● perform matrix row operations. ● use matrices and Gaussian elimination to solve systems. ● use matrices and Gauss Jordan elimination to solve systems.

Lower Cape May Regional School District (Insert Subject/Content Area) Curriculum Evidence of Learning
Specific Formative Assessments Utilized in Daily Lessons: ● Misconception check, student conference, observation, self-assessment, quiz, Think-Pair- Share/Turn to Your Partner, oral questioning ● Big Ideas online assessments
Summative Assessment Utilized throughout Units: ● QBA's ● Benchmarks: Big Ideas Quizzes & Tests, Big Ideas online assessments

Modifications for ELL's, Special Education, 504, and Gifted and Talented Students:
Teacher tutoring
Peer tutoring
Cooperative Learning
Groups Modified
Assignments Differentiated
Instruction
Response to Intervention (www.help4teachers.com)
Follow all IEP and 504 modifications

Teacher Notes:

- As required by the NJ Department of Education, teachers in all content areas will integrate the 21st Century Life and Careers Standards. As the NJDOE indicates, "Providing New Jersey students with the life and career skills needed to function optimally within this dynamic context is a critical focus and organizing principle of K-12 public education. New Jersey has both an obligation to prepare its young people to thrive in this environment, and a vested economic interest in grooming an engaged citizenry made up of productive members of a global workforce that rewards innovation, creativity, and adaptation to change." The links below indicate the CPIs for grade ranges and need to be addressed throughout the units of study:

  Life and Career Standards

- As indicated in the NJSLS, standards and interdisciplinary connections will be integrated throughout content area curriculum. Links to relevant content standards can be found below:

  HSA.SSE.A.1, HSA.SSE.A.2, HSA.SSE.B.3, HSA.SSE.B.4, HSA.APR.A.1, HSA.APR.B.2, HSA.APR.B.3, HSA.APR.C.4, HSA.APR.C.5, HSA.APR.D.6, HSA.APR.D.7, HSA.CED.A.1, HSA.CED.A.2, HSA.CED.A.3, HSA.CED.A.4, HSA.REI.A.1, HSA.REI.A.2, HSA.REI.B.3, HSA.REI.B.4, HSA.REI.C.5, HSA.REI.C.6, HSA.REI.C.7, HSA.REI.C.8, HSA.REI.C.9, HSA.REI.D.10, HSA.REI.D.11, HSA.REI.D.12, HSF.IF.A.1, HSF.IF.A.2, HSF.IF.A.3, HSF.IF.B.4, HSF.IF.B.5, HSF.IF.B.6, HSF.IF.C.7, HSF.IF.C.8, HSF.IF.C.9, HSF.BF.A.1, HSF.BF.A.2, HSF.BF.B.3, HSF.BF.B.4, HSF.BF.B.5, HSF.LE.A.1, HSF.LE.A.2, HSF.LE.A.3, HSF.LE.A.4, HSF.LE.B.5, HSF.TF.A.1, HSF.TF.A.1, HSF.TF.A.2,

HSF.TF.A.3, HSF.TF.A.4, HSF.TF.B.5, HSF.TF.B.6, HSF.TF.B.7, HSF.TF.C.8, HSF.TF.C.9, HSS.ID.A.1, HSS.ID.A.2, HSS.ID.A.3, HSS.ID.A.4, HSS.ID.B.5, HSS.ID.B.6, HSS.ID.C.7, HSS.ID.C.8, HSS.ID.C.9, HSS.IC.A.1, HSS.IC.A.2, HSS.IC.B.3, HSS.IC.B.3, HSS.IC.B.4, HSS.IC.B.5, HSS.IC.B.6, HSS.CP.A.1, HSS.CP.A.2, HSS.CP.A.3, HSS.CP.A.4, HSS.CP.A.5, HSS.CP.B.6, HSS.CP.B.7, HSS.CP.B.8, HSS.CP.B.9, HSS.MD.A.1, HSS.MD.A.2, HSS.MD.A.3, HSS.MD.A.4, HSS.MD.B.5, HSS.MD.B.6, HSS.MD.B.7

http://www.corestandards.org/Math/

Technology:
Students will engage in technology applications integrated throughout the curriculum.
Applicable technology utilized in this curricula are included below:
Ti-83 Calculators
Desmos
Big Ideas
Khan Academy

Resources:
Ancillary resources and materials used to deliver instruction are included below:
Various technology & math websites
Supplemental material created by the teacher as needed

Curriculum development Resources/Instructional Materials:
List or Link Ancillary Resources and Curriculum Materials Here: ● Big Ideas ● Various technology & math websites ● Supplemental material created by the teacher as needed
Board of Education Approved Text(s)
● Big Ideas Math - Algebra 2