

Course Title: Algebra I

Text: Algebra I, Holt, written by Nichols, Edwards, Garland, Hoffman, Mamary, and Palmer.

Supplemental: Scientific calculator suggested

Course Description: This is a first year Algebra course. Students will study the simplifying of expressions using the 4 operations and will factor polynomials. Students will study the solving of various algebraic equations and inequalities, ratios, proportions including real life situations. Students will study coordinate geometry including the graphing and solving of linear equations.

Prerequisite Course: Pre-Algebra (8th grade or high school)

Grade Level: 9-12

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns ratios and proportions.

Illinois Learning Standards

6.A.4 Identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots.

6.B.4 Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget and balancing a checkbook.

6.B.5 Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.

Student Learning Objective

1. The student will be able to identify and apply real number properties and relationships.

1. The student will be able to use various number forms(percent, decimals, etc.) and operations in real life situations.

1. The student will be able to work with scientific notation, using exponent rules and their calculator, to express very large and small numbers.

6.C.4 Determine whether exact values or approximations are appropriate.

1. The student will be able to use the correct types of values when solving linear, quadratic and proportion equations.

6.D.4 Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.

1. The student will be able to use equations and proportions to solve problems involving recipes and financial calculations.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7.A.4b Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.

Student Learning Objective

1. The student will be able to use formulas involving area, perimeter, time temperature, speed, and distance.

7.C.4a Make indirect measurements, including heights and distances, using proportions(e.g., finding the height of a tower by its shadow).

1. The student will be able to measure the flagpole using similar triangles.

7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.

1. The student will be able to convert units in the metric and standard measuring systems, including problems involving area.

State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

Illinois Learning Standard

8.A.3b Solve problems using linear expressions, equations and inequalities.

Student Objective

1. The student will be able to solve multiple step algebraic equations and inequalities.

2. The student will be able to simplify variable expressions.

8.B.4a Represent algebraic concepts with physical materials, words, diagrams, tables, graphs, equations and inequalities and use appropriate technology.

1. The student will be able to display graphs of linear equations and inequalities on a coordinate plane and a number line.

8.B.4b Use the basic functions of absolute value, square root, linear, quadratic and step to describe numerical relationships.

1. The student will be able to apply absolute value, linear and quadratic equations discover numerical patterns.

8.D.4 Formulate and solve linear and quadratic equations and linear inequalities algebraically and investigate nonlinear inequalities using graphs, tables, calculators and computers.

1. The student will be able to write, solve and graph equations and inequalities.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions and points, lines, planes and space.

Illinois Learning Standards

9.B.4 Recognize and apply relationships within and among geometric figures.

Student Learning Objectives

1. The student will be able to use algebraic steps with geometric formulas to solve problems involving various shapes.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Illinois Learning Standard

10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.

Student Learning Objective

1. The student will be able to analyze baseball scores using measures of central tendency.

10.C.4a Solve problems of chance using the principles of probability including conditional settings.

1. The student will be able to use ratios to solve probability problems including compound events.

Course Title: Applied Math

Text: Applied Mathematics

Course Description: This course is designed for students to take after completing Pre-Algebra in either junior high or high school. The class will feature real-life applications that involve mathematics. This class can be taken simultaneously with Algebra I. Specific areas of concentration include scale drawings, statistics, probability, ratios, proportions, percents, basic trigonometry, basic geometry, economic applications.

Prerequisite Course: Pre-Algebra or Algebra I

Grade Level: 9-12

Course Length: 1year

Credit: 1 credit

State Goals and Objectives:

State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

Illinois Learning Standard

6.C.4 Determine whether exact values or approximations are appropriate (e.g., bid a job, determine gas mileage for a trip).

6.C.5 Determine the level of accuracy needed for computations involving measurement and irrational numbers.

6.D.4 Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.

Student Learning Objective

1. The student will be able to determine how much material is needed to build a building, and give estimates of the cost.

1. The student will be able to add a list of measurements accurately.

1. The student will be able to calculate interest, and solve proportions using ratios.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7.A.4a Apply units and scales to describe and compare numerical data and physical objects.

7.A.4b Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density, and monetary values.

7.B.5 Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.

7.C.4a Make indirect measurements, including heights and distances, using proportions (e.g., finding the height of a tower by its shadow).

Student Learning Objective

1. The student will be able to convert measurements between English and metric systems.

1. The student will be able to solve measurements on 2-D and 3-D objects.
2. The student will be able to determine material needed using perimeter, area, volume formulas.

1. The student will be able to apply formulas to solve problems dealing with real-life objects (car windows, roofs).

1. The student will find the height of the objects by comparing ratios and proportions.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7.C.4b Interpret scale drawings and models using maps and blueprints.

7.C.5b Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of the cube is halved).

7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.

Student Learning Objective

1. The student will be able to read and calculate measurements from scale drawings.
2. The student will be able to draw a scale drawing.

1. The student will be able to use ratios and reasoning skills to determine appropriate solutions to real life problems.

1. The student will be able to convert between the English and Metric systems using the appropriate ratios.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space

Illinois Learning Standard

9.A.5 Use geometric figures and their properties to solve problems in the arts, the physical and life sciences and the building trades, with or without the use of technology.

9.A.4b Make perspective drawings, tessellations and scale drawings, with and without the use of technology

Student Learning Objective

1. The student will be able to solve problems dealing with building structures, agriculture and health occupations.

1. The student will be able to draw a scale drawing on graph paper.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Illinois Learning Standard

10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.

10.B.4 Design and execute surveys or experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.

10.C.5a Compute conditional probabilities and the probabilities of independent events.

Student Learning Objective

1. The student will be able to calculate the mean, median, mode with the use of a calculator.

1. The student will conduct a survey of their peers.
2. The student will be able to display their results in appropriate graphs and/or charts using the computer.
3. The student will be able to evaluate and draw conclusions from their data collected.

1. The student will be able to figure probabilities of given events.

Course Title: Calculus

Text: Calculus, Prentice Hall, written by Varberg and Purcell

Supplemental: Graphing calculator suggested

Course Description: This course is a study of functions. Specific areas of concentration will be limits, continuity, derivatives and their applications, integrals and their applications, and graphing.

Prerequisite Course: Advanced Math

Grade Level: 12

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7. B.5. Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.

7. C.5.a. Use dimensional analysis to determine units and check answers in applied measurement problems.

7. C.5.b. Determine how changes in one measure may affect other measures (e.g., what happens to the volume and surface area of a cube when the side of a cube is halved).

Student Learning Objective

1. Students will be able to make accurate estimations of area and volume of odd-shaped regions and solids.
2. Students will be able to choose appropriate labels for answers.
3. Students will be able to solve problems where one rate of change affects another rate of change.

State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

Illinois Learning Standard

8. B.5. Use functions including exponential, polynomial, rational, parametric, logarithmic, and trigonometric to describe numerical relationships.

8. C.5. Use polynomial, exponential, logarithmic, and trigonometric functions to model situations.

Student Learning Objective

1. Students will be able to graph and interpret functions involving height, distance traveled, amount of profit, etc.
2. Students will be able to form a function to match a real-life situation.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

Illinois Learning Standard

9. B.4. Recognize and apply relationships within and among geometric figures.

9. C.5.b. Apply physical models, graphs, coordinate systems, networks and vectors to develop solutions in applied contexts (e.g., bus routing, areas of irregular shapes, describing forces and other physical quantities).

9. D.4. Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.

9. D.5. Analyze and solve problems involving periodic patterns (e.g., sound waves, tide variations) using circular functions and communicate results orally and in writing.

Student Learning Objective

1. Students will be able to apply geometric properties within Calculus problems.
2. Students will be able to combine coordinate geometry with Calculus to find distance covered by a belt.
3. Students will be able to use trigonometry within related rate problems.
4. Students will be able to find instantaneous velocities on circular functions (such as a ferris wheel).

Course Title: Geometry

Text: Geometry, Houghton Mifflin, written by Jurgensen, Brown, and Jurgensen.

Supplemental: Scientific calculator suggested

Course Description: This course is a study of plane geometry and solid geometry. Specific areas of concentration will include properties of angles, lines, polygons, trigonometric ratios, circles, and solids.

Prerequisite Course: Algebra I (8th grade or high school)

Grade Level: 9-12

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

Illinois Learning Standard

6. A.4. Identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots.

6. B.4. Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget and balancing a checkbook.

6. C.5. Determine the level of accuracy needed for computations involving measurement and irrational numbers.

6. D.4. Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.

Student Learning Objective

1. Students will be able to apply algebra concepts within geometric situations.
2. Students will be able to choose proper labels to use within geometric problems finding area, volume, angle measure, etc.
3. Students will be able to decide when to estimate an answer and when to get an exact answer.
4. Students will be able to recognize similar polygons and apply scale factors to find missing information.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7. A.4.a. Apply units and scales to describe and compare numerical data and physical objects.

7. A.4.b. Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.

7. B.4. Estimate and measure the magnitude and directions of physical quantities (e.g., velocity, force, slope) using rulers, protractors and other scientific instruments including timers, calculators and computers.

7. B.5. Estimate perimeter, area, volume, and capacity of irregular shapes, regions and solids and explain the reasoning supporting the estimate.

7. C.4.a. Make indirect measurements, including heights and distances, using proportions (e.g., finding the height of a tower by its shadow).

7. C.4.b. Interpret scale drawings and models using maps and blueprints.

7. C.4.c. Convert within and between measurements systems and monetary systems using technology where appropriate.

Student Learning Objective

1. Students will be able to measure length using different units.
2. Students will be able to find the area of polygons and circles and find the volume of solids.
3. Students will be able to graph linear equations using slope-intercept form.
4. Students will be able to find the area of shapes made up of a combination of smaller shapes.
5. Students will use similar triangles to solve for missing information in a real-life situation.
6. Students will be able to convert measurements from a scale drawing to actual measurements.
7. Students will be able to convert distance measurements from one unit to another.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes, and space.

Illinois Learning Standard

9. A.4.a. Construct a model of a three-dimensional figure from a two-dimensional pattern.

9. A.4.b. Make perspective drawings, tessellations and scale drawings, with and without the use of technology.

9. B.4. Recognize and apply relationships within and among geometric figures.

9. B.5. Construct and use two- and three-dimensional models of objects that have practical applications (e.g., blueprints, topographical maps, scale models).

9. C.4.a. Construct and test logical arguments for geometric situations using technology where appropriate.

9. C.4.b. Construct and communicate convincing arguments for geometric situations.

9. C.4.c. Develop and communicate mathematical proofs (e.g., two-column, paragraph, indirect) and counterexamples for geometric statements.

9. C.5.a. Perform and describe an original investigation of a geometric problem and verify the analysis and conclusions to an audience.

9. C.5.b. Apply physical models, graphs, coordinate systems, networks and vectors to develop solutions in applied contexts (e.g., bus routing, areas of irregular shapes, describing forces and other physical quantities).

9. D.3. Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.

Student Learning Objective

1. Students will be able to make a cube from a piece of paper.
2. Students will be able to make a scale drawing of a room or house.
3. Students will be able to recognize how changing length measurements on polygons affects the area and the perimeter.
4. Students will use scale drawings to estimate area and volume of objects.
5. Students will be able to develop a formula from given information such as total number of degrees of different polygons.
6. Students will be able to explain how they developed a formula that matches a geometric situation.
7. Students will be able to construct a 2-column proof showing that 2 triangles are congruent to each other.
8. Students will be able to develop a solution to a geometric situation requiring a combination of 2 or more previously learned concepts.
9. Students will be able to find area of a polygon that is formed by several common shaped polygons.
10. Students will be able to find missing legs or hypotenuses using Pythagorean Theorem.

9. D.4. Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios.

11. Students will be able to find missing lengths in a triangle using Sin/Cos/Tan.

Course Title: Pre-Algebra

Text: Mathematical Connections: A Bridge to Algebra and Geometry, Houghton Mifflin, written by Gardella, Frazee, Meldon, and Weingarden.

Supplemental: Scientific calculator suggested

Course Description: This course prepares students for Algebra I by covering a variety of Algebra and Geometry topics. Students will solve real life problems using a variety of techniques. Students will solve 1 and 2 step equations. Students will learn basic geometry involving lines, angles and polygons.

Prerequisite Course: None

Grade level: 9-11

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations(addition, subtraction, multiplication, division), patterns, ratios and proportions.

Illinois Learning Standard

6.A.4 Identify and apply the associative, commutative, distributive and identity properties of real numbers, including special numbers such as pi and square roots.

6.B.4 Select and use appropriate arithmetic operations in practical situations including calculating wages after taxes, developing a budget, and balancing a checkbook.

6.B.5 Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.

Student Learning Objective

1. The student will be able to use basic mathematical properties to evaluate expressions.

1. The student will be able to apply strategies to real world problems involving monetary situations.

1. The student will be able to write and interpret very large and small numbers using scientific notation.

6.C.4 Determine whether exact values or approximations are appropriate.

1. The student will be able to solve application problems and determine the correct form and units needed.

6.D.4 Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios, proportions and percents.

1. The student will be able to convert recipes, project populations, and find missing sides on a triangle using proportions.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

Student Learning Objective

7.A.4a Apply units and scales to describe and compare numerical data and physical objects.

1. The student will be able to use correct units for situations involving area and perimeter.

7.A.4b Apply formulas in a wide variety of theoretical and practical real world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density, and monetary values.

1. The student will be able to use perimeter and area formulas to solve application problems.

7.B.4 Estimate and measure the magnitude and directions of physical quantities.

1. The student will be able to use a ruler, protractor and compass to measure in various situations.

7.C.4a Make indirect measurements, including heights and distances, using proportions.

1. The student will be able to measure the height of a basket or light pole using proportions.

7.C.4b Interpret scale drawings and models using maps and blueprints.

1. The student will be able to understand the use of scales in models.

7.C.4c Convert within and between measurement systems and monetary systems using technology where appropriate.

1. The student will be able to convert metric and standard units.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about point, line, planes and space.

Illinois Learning Standard

9A.4b Make perspective drawings, tessellations and scale drawings, with and without the use of technology.

Student Learning Objective

1. The student will be able to make a scale drawing of a classroom.

9.B.4 Recognize and apply relationships within and among geometric figures.

1. The student will be able to apply relationships such as congruence and similarity.

9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.

1. The student will be able to find lengths of sides on a triangle using proportions.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Illinois Learning Standard

10.A.4a Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatter plots and box plots.

Student Learning Objective

1. The student will be able to make and interpret bar graphs, box and whisker plots, frequency tables and other data representations.

10.A.4b Analyze data using mean, median, and mode range variance and standard deviation of a data set, with and without the use of technology.

1. The student will be able to evaluate measurements of central tendency.

10.B.5 Design a statistical experiment to answer a question about a realistic situation, conduct the experiment, use statistics to interpret the data and communicate the results, individually and as members of a team.

1. The student will be able to create graphic representations of collected data.

Course Title: Advanced Math

Text: **Functions, Statistics and Trigonometry, Scott-Foresman-Addison-Wesley**

Supplemental: Graphing calculator suggested

Course Description: This course will cover 3 main topics: Functions, Statistics, and Trigonometry. Areas of concentration on functions will be evaluating, graphing, and developing functions. Areas of concentration in statistics will be the different ways to measure and compare data. Areas of concentration in trigonometry will graphing, applying trigonometry to daily situations, and solving triangles.

Prerequisite Course: Algebra II

Grade Level: 11-12

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 6: Demonstrate and apply a knowledge and sense of numbers, including numeration and operations (addition, subtraction, multiplication, division), patterns, ratios and proportions.

Illinois Learning Standard

Student Learning Objective

6. A.5. Perform addition, subtraction and multiplication of complex numbers and graph the results in the complex plane.

1. Students will be able to work with imaginary numbers.

6. B.5. Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.

2. Students will be able to understand exponential functions and logarithmic functions.

6. C.5. Determine the level of accuracy needed for computations involving measurement and irrational numbers.

3. Students will be able to know when to estimate answers and when to use an exact answer.

6. D.5. Solve problems involving loans, mortgages and other practical applications involving geometric patterns of growth.

4. Students will be able to work with the exponential growth and decay formula.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7. A. 5. Apply nonlinear scales (e.g., Richter, decibel, pH) to solve practical problems.

Student Learning Objective

1. Students will be able to understand the Richter Scale and compare measures of different earthquakes.

State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

Illinois Learning Standard

8. A.4.a. Use algebraic methods to convert repeating decimals to fractions.

8. A.4.b. Represent mathematical patterns and describe their properties using variables and mathematical symbols.

8. A.5. Solve mathematical problems involving recursive patterns and use models that employ such relationships.

8.B.4.b. Use the basic functions of absolute value, square root, linear, quadratic and step to describe numerical relationships.

8.B.5. Use functions including exponential, polynomial, rational, parametric, logarithmic, and trigonometric to describe numerical relationships.

8.C.4.a. Analyze and report the effects of changing coefficients, exponents and other parameters on functions and their graphs.

8.C.4.b. Apply algebraic properties and procedures with matrices, vectors, functions, and sequences using data found in business, industry and consumer situations.

8.C.5. Use polynomial, exponential, logarithmic and trigonometric functions to model situations.

Student Learning Objective

1. Students will be able to convert a repeating decimal into a fraction.

2. Students will be able to recognize and work with arithmetic and geometric sequences.

3. Students will be able to develop formulas that match a set of data.

4. Students will be able to recognize the affect different basic functions have on numbers.

5. Students will be able to recognize the affect different advanced functions have on numbers.

6. Students will be able to predict the shape of a function's graph from the graph of an original function and a similar function.

7. Students will be able to work with matrices and vectors involving real-life situations.

8. Students will be able to create a function that matches a physical/financial situation.

8.D.4. Formulate and solve linear and quadratic equations and linear inequalities algebraically and investigate nonlinear inequalities using graphs, tables, calculators and computers.

8. D.5. Formulate and solve nonlinear equations and systems including problems involving inverse variation and exponential and logarithmic growth and decay.

9. Students will be able to graph and solve linear equations using tables, graphs, and calculators.

10. Students will be able to understand the graphs of logarithmic and exponential functions.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

Illinois Learning Standard

9. B.4. Recognize and apply relationships within and among geometric figures.

9. D.4. Analyze and solve problems involving triangles (e.g., distances which cannot be measured directly) using trigonometric ratios

9. D.5. Analyze and solve problems involving periodic patterns (e.g., sound waves, tide variations) using circular functions and communicate results orally and in writing.

Student Learning Objective

1. Students will be able to understand how a change in one part of a triangle affects other parts of the triangle.
2. Students will be able to apply trigonometric ratios and the Law Of Sines and the Law Of Cosines.
3. Students will be able to graph trigonometric functions and apply the graphs to real-life situations.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Illinois Learning Standard

10. A.4.a. Represent and organize data by creating lists, charts, tables, frequency distributions, graphs, scatterplots and box-plots.

10. A.4.b. Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.

10. A.4.c. Predict from data using interpolation, extrapolation and trend lines, with and without the use technology.

10. A.5. Construct a statistics-based presentation, individually and as members of a team, to communicate and justify the results of a project.

10. B.4. Design and execute surveys or experiments, gather data to answer relevant questions, and communicate results and conclusions to an audience using traditional methods and contemporary technology.

10. B.5. Design a statistical experiment to answer a question about a realistic situation, conduct the experiment, use statistics to interpret the data, and communicate the results, individually and as members of a team.

Student Learning Objective

1. Students will be able to represent data using several different methods.
2. Students will be able to analyze data using several different methods.
3. Students will be able to use given data to make predictions related to the data.
4. Students will be able to develop a summary of a data set, including interpretation of the results.
5. Students will be able to develop a survey and gather results and then interpret the results.
6. Students will be able to create an experiment, conduct the experiment, and interpret the results of the experiment.

Course Title: Algebra II

Text: Algebra II with Trigonometry, Holt, written by Nichols, Edwards, Garland, Hoffman, Mamary and Palmer.

Supplemental: Graphing calculator suggested(Texas Instruments)

Course Description: This is a preparatory course for college Algebra. Students will learn methods to solve linear systems and quadratic equations. Students will learn how to simplify rational expressions, radical and complex numbers. Students will identify patterns and properties related to matrices, the coordinate plane and conic sections.

Prerequisite Course: Geometry

Grade Level: 10-12

Course Length: 1 year

Credit: 1

State Goals and Objectives:

State Goal 6: Demonstrate and apply knowledge and a sense of numbers, including numeration and operations(addition, subtraction, multiplication, division), patterns, ratios and proportions.

Illinois Learning Standard

6.A.5 Perform addition, subtraction and multiplication of complex numbers and graph the results in a complex plane.

6.B.5 Identify, represent and apply numbers expressed in exponential, logarithmic and scientific notation using contemporary technology.

6.C.5 Determine the level of accuracy needed for computations involving measurement and irrational numbers.

6.D.4 Solve problems involving recipes or mixtures, financial calculations and geometric similarity using ratios proportions and percents.

Student Learning Objective

1. The student will be able to simplify imaginary and complex numbers.

1. The student will be able to simplify exponents using the established operation rules.

1. The student will be able to solve problems involving radicals(distances on a baseball field).

1. The student will be able to use algebra to solve mixture and interest problems.

State Goal 7: Estimate, make and use measurements of objects, quantities and relationships and determine acceptable levels of accuracy.

Illinois Learning Standard

7.A.4a Apply units and scales to describe and compare numerical data and physical objects.

Student Learning Objective

1. The student will be able to understand how different units of length are related and their conversion factors.

7.A.4b Apply formulas in a wide variety of theoretical and practical real-world measurement applications involving perimeter, area, volume, angle, time, temperature, mass, speed, distance, density and monetary values.

1. The student will be able to use formulas to solve problems involving perimeter, area, volume, time, temperature, speed, distance and monetary values.

State Goal 8: Use algebraic and analytical methods to identify and describe patterns and relationships in data, solve problems and predict results.

Illinois Learning Standard

8.A.4a Use algebraic methods to convert repeating decimals into fractions.

Student learning Objective

1. The student will be able to convert repeating decimals into fractions with and without their calculator.

8.A.3b Solve problems using linear expressions, equations and inequalities.

1. The student will be able to solve linear expressions, equations and inequalities algebraically and graphically

8.A.4b Represent mathematical patterns and describe their properties using variables and mathematical symbols.

1. The student will be able to identify number patterns and use number patterns.

8.A.5 Solve mathematical problems involving recursive patterns and use models that employ such relationships.

1. The student will be able to identify the pattern in the Fibonacci sequence.

8.B.4a Represent algebraic concepts with physical materials, words, diagrams, tables, graphs, equations and inequalities and use appropriate technology.

1. The student will be able to write equations from words and graph equations by hand and with their calculators.

8.B.4b Use basic functions of absolute value, square root, linear, quadratic and step to describe numerical relationships.

1. The student will be able to simplify and solve equations involving absolute value, radical, linear and quadratic.

8.C.4a Analyze and report the effects of changing coefficients, exponents and other parameters on functions and their graphs.

1. The student will be able to identify equations for conic sections and graph parabolas by patterns within their functions.

8.C.4b Apply algebraic properties and procedures with matrices, vectors, functions and sequences using data found in business, industry and consumer situations.

1. The student will be able to use their graphing calculators to perform operations with matrices and solve linear systems.

8.D.4 Formulate and solve linear and quadratic equations and linear inequalities algebraically and investigate nonlinear inequalities using graphs, tables, calculators and computers.

1. The student will be able to solve equations using their graphs and aided by their graphing calculators.

State Goal 9: Use geometric methods to analyze, categorize and draw conclusions about points, lines, planes and space.

Illinois Learning Standard

Student Learning Objective

9.B.4 Recognize and apply relationships within and among geometric figures.

1. The student will be able to use geometric relationships to solve application problems.

9.C.4c Develop and communicate mathematical proofs and counter examples for geometric statements.

1. The student will be able to prove quadrilaterals using coordinate geometry.

9.D.3 Compute distances, lengths and measures of angles using proportions, the Pythagorean theorem and its converse.

1. The student will be able to determine the size of a TV, distances on a softball field etc. using the Pythagorean Theorem.

State Goal 10: Collect, organize and analyze data using statistical methods; predict results; and interpret uncertainty using concepts of probability.

Illinois Learning Standard

10.A.4b Analyze data using mean, median, mode, range, variance and standard deviation of a data set, with and without the use of technology.

10.C.4a Solve problems of chance using the principles of probability including conditional settings.

10.C.5a Compute conditional probabilities and the probabilities of individual events.

10.C.4b Design and conduct simulations with and without the use of technology.

10.C.4c Propose and interpret discrete probability distributions, with and without the use of technology.

Student Learning Objective

1. The student will be able to calculate the standard deviation of a set of test scores.

1. The student will be able to evaluate theoretical probability involving dependent and independent events.

1. The student will be able to use the Fundamental Counting Principle to figure the probability of an event.

1. The student will be able to evaluate the experimental probability of an event.

1. The student will be able to make a tree diagram and list the sample space.