Teacher: Black	Course: Algebra 2	Grade Level(s): 10-12
	Unit:1 Topic(s): Equations and Inequalities	
Content/Big Ideas	Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations.	
Essential Questions	How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How can expressions, equations and inequalities be used to quantify, solve, model, and/or analyze mathematical situations	
Concepts	Expressions &Formulas, Properties of Real Numbers, Solving Equations, Solving Absolute Value Equations, Solving Inequalities, Solving Compound and Absolute Value Inequalities	
Competencies	Create and/or solve equations (including literal, polynomial, rational, radical, exponential, and logarithmic) both algebraically and graphically. Use exponents, roots, and/or absolute values to represent equivalent forms or to solve problems. Use and/or explain reasoning while solving equations, and justify the solution method. Determine how a change in one variable relates to a change in a second variable	
Standards/Benchmarks	CC.2.2.HS.D.7 CC.2.2.HS.D.8 CC.2.2.HS.D.9 CC.2.2.HS.D.10 A2.1.2.1.3 A2.1.2.1.4 A2.1.2.2.2 A2.1.3.1.1 A2.1.3.1.3 A2.1.3.1.4 A2.1.3.2.1 A2.1.3.2.2 A2.2.2.1.2 A2.2.2.1.3	

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*
	Unit:2 *Topic(s): Linear Relations and Functions*	
Content/Big Ideas	*Mathematical relations and functions can be modeled through multiple representations and analyzed to raise and answer questions.*	

Essential Questions	*How can data be organized and represented to provide insight into the relationship between quantities?*
Concepts	*Representing Relations and Functions, Slope and Rate of Change, Writing Linear Equations, Direct Variation, Scatter Plots and Lines of Regression, Absolute Value Functions and Transformations, Linear inequalities in two variables.*
Competencies	*Analyze and/or interpret data on a scatter plot and/or use it to make predictions (e.g., regression).* *Determine Relations vs Functions* *Apply the concept of slope to real-world examples* *Write and model linear equations* *Apply transformations to parent functions* *Use linear inequalities to model real world situations*
Standards/Benchmarks	*A.2.2.1.1.3, A.2.2.1.1.1, A.1.2.1.2.2, A*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*

	Unit:3 *Topic(s): Systems of Equations and Inequalities*
Content/Big Ideas	*Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations*
Essential Questions	*How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations?* *What makes a tool and/or strategy appropriate for a given task?*

Concepts	*Solving Systems of Equations, Solving Systems of Inequalities, Systems of Equations in Three Variables, Operations with Matrices, Solving Systems of Equations Using Inverse Matrices**
Competencies	*Interpret solutions to linear equations and inequalities. Interpret solutions to linear systems of equations and inequalities.*
Standards/Benchmarks	*A1.1.2.1.1 A1.1.2.1.2 A1.1.2.1.3 A1.2.1.2.1 A1.2.1.2.2 A1.1.2.2.1 A1.1.2.2.2, A1.1.3.1.1 A1.1.3.1.2 A1.1.3.1.3 A1.1.3.2.1 A1.1.3.2.2*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*

	Unit: 4 *Topic(s): Quadratic Functions and Relations*
Content/Big Ideas	*Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools.*

Essential Questions	*How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations? What does it mean to estimate or analyze numerical quantities? What makes a tool and/or strategy appropriate for a given task?*
Concepts	*Graph Quadratic Functions, Solve Quadratic Functions, Factor Polynomials, Complex Numbers, Complete the Square, Quadratic Formula, Discriminant, Quadratic Inequalities, Transformations of Quadratic Graphs*
Competencies	*Represent and/or use imaginary numbers in equivalent forms. Simplify/evaluate expressions involving imaginary numbers. Perform arithmetic operations and apply to complex numbers.*
Standards/Benchmarks	*A2.1.1.1.1 A2.1.1.1.2 A2.1.1.2.1 A2.1.1.2.2, A2.1.3.1.1, A2.2.2.2.1*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*
Teacher: Black	*Course: Algebra 2* *Grade Level(s): 10-12*
	Unit:5 *Topic(s): Polynomials and Polynomial Functions*
Content/Big Ideas	*Mathematical relationships among numbers can be represented, compared, and communicated. Mathematical relationships can be represented as expressions, equations and inequalities in mathematical situations. Numerical quantities, calculations, and measurements can be estimated or analyzed by using appropriate strategies and tools*

Essential Questions	*How is mathematics used to quantify, compare, represent, and model numbers? How can mathematics support effective communication? How are relationships represented mathematically? How can expressions, equations and inequalities be used to quantify, solve, model and/or analyze mathematical situations? What makes a tool and/or strategy appropriate for a given task?*
Concepts	*Use Properties of Exponents, Evaluate and Graph Polynomial Functions, Add, Subtract, and Multiply Polynomials, Factor and Solve Polynomial Equations, Apply the Remainder and Factor Theorems.*
Competencies	*Perform arithmetic operations on polynomials. Understand the relationship between zeros and factors of polynomials. Rewrite rational expressions. Simplify/factor expressions involving polynomials*
Standards/Benchmarks	*A2.1.2.1.2 A2.1.3.1.2 A2.1.2.2.1 A2.1.2.2.2, A.2.2.1.1.4, A2.2.2.1.1, A2.2.1.1.4, A2.2.2.1.3, A2.2.2.1.4, A2.2.3.1.1, A2.2.3.1.2*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*

	Unit: 6 *Topic(s): Rational Exponents and Radical Functions*
Content/Big Ideas	*Students will learn the meaning of nth roots and rational exponents, how to interchange rational exponent notation and radical notation, and how to apply the properties of rational exponents. Next, they will perform function operations, including composition. They will learn how to determine whether a function has an inverse that is also a function. Finally, students will graph square root and cube root functions.*

Essential Questions	*What is the relationship between nth roots and rational exponents?* *How are the properties of rational exponents related to the properties of integer exponents?* *What operations can be performed on a pair of functions to obtain a third function?* *How do you find the inverse relation of a given function?* *What do the graphs of square root and cube root functions look like?* *Why is it necessary to check every apparent solution of a radical equation in the original equation?*
Concepts	*Operations on Functions, Inverse Functions and Relations, Square Root Functions and Inequalities, nth roots, Operations with Radical Expressions, Rational Exponents.*
Competencies	*Evaluate nth roots, apply properties of rational exponents, perform function operations and composition, use inverse operations, Graph square root and cube root functions, solve radical equations*
Standards/Benchmarks	*A2.2.1.1.3, A2.2.2.2.1, A2.1.2.1.2, A2.1.3.1.2*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*

	Unit:7 *Topic(s): Conic Sections*
Content/Big Ideas	*Introduction to distance and midpoint formulas and writing equations of circles and graphing circles.*

Essential Questions	*If you are given the coordinates of endpoints of the diameter of a circle, how can you fins the center and radius of the circle?* *What information do you need to write the equation of a circle with center (0,0)?*
Concepts	*Distance, midpoint, circle, equation of circles*
Competencies	*SWBAT apply the distance and midpoint formulas, SWBAT write equations of circles and graph circles given the equation of a circle.*
Standards/Benchmarks	*CC.2.3.HS.A.10*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*

Teacher: Black	*Course: Algebra 2*	*Grade Level(s): 10-12*

	Unit: 8 *Topic(s): Logarithmic and exponential functions*
Content/Big Ideas	*Students will learn how to evaluate logarithmic functions and use the properties of logarithmic expressions. Students will solve exponential and logarithmic equations.*

Essential Questions	*What is the relationship between exponential and logarithmic functions?* *How can you use a calculator to evaluate a logarithm when the base is not 10 or e?* *Why do logarithmic equations sometimes have extraneous solutions?*
Concepts	*Logarithm, logarithmic function, logarithmic equation, common logarithm, change of base formula, natural base, e, natural logarithm*
Competencies	*SWBAT apply inverse operations to solve equations*
Standards/Benchmarks	*A2.1.2.1.4, A2.1.3.1.3, A2.1.3.1.3, A2.1.3.1.4, A2.2.2.1.4*

Activities & Assessments	*Debates* *Directed Paraphrasing* *Exit Ticket* *Follow-up Questioning* *Gallery* *Graphic Organizers* *KWL charts* *Guided Reciprocal Peer Questioning* *Hand Signals* *Interviews* *Journals* *Learning* *Muddiest Point* *"No Hands Up"* *A "No Hands Up"* *Open-ended Questions* *One-sentence Summary* *Performance Task* *Quick Write* *Random* *Rubrics* *Short Quizzes* *Student-generated Test* *Surveys/Rating Scales Surveys and Rating Scales provide an easy-to-use* *Think-Pair-Share* *Write Before Discussion* *Graphic Organizer* *Unit Assessment* *Notebook Check* *Homework* *Correct the Error*