

Wilson Area School District Planned Course Guide

Title of planned course: Algebra 3

Subject Area: Mathematics

Grade Level: 11 – 12

Course Description: Review and expand on the concepts of fundamental operations of algebraic expressions special products and factors, fractions, exponents and radicals, solving equations, and systems of equations. Other topics include graphing, transformations of non-linear graphs, progressions and logarithms.

Time/Credit for this Course: Half Year / 0.5 Credit

Curriculum Writing Committee: Michael Fowler

Curriculum Map

<u>August / January</u>	Functions and Graphs
<u>September / February</u>	Functions and Graphs
<u>October / March</u>	Functions and Graphs Polynomials and Rational Functions
<u>November / April</u>	Polynomials and Rational Functions
<u>December / May</u>	Polynomials and Rational Functions Exponential and Logarithmic Functions
<u>January / June</u>	Exponential and Logarithmic Functions

Planned Course Materials

Course Title: Pre-Calculus

Textbook: Blitzer Pre-Calculus 4e
Pearson / Prentice Hall
2010

Teacher Resources:

- Textbook
- Multimedia
- Calculators
- Worksheets
- Smartboard

Curriculum Scope & Sequence

Planned Course: Algebra 3

Unit: Functions and Graphs

Time frame: 15 – 17 Blocks

State Standards: 2.1.11.C, 2.1.11.E, 2.5.11.A, 2.5.11.B, 2.6.11.C, 2.8.11.B, 2.8.11.C, 2.8.11.D, 2.8.11.E, 2.8.11.F, 2.11.11A

Anchor(s) or adopted anchor: M11.A.2, M11.A.3, M11.B.2, M11.D.1, M11.D.2, M11.D.4, M11.E.3

Essential content/objectives: At the end of the unit, students will be able to:

- Plot points and graph equations in the rectangular coordinate system
- Interpret information given by graphs
- Find the domain and range of a function, determine if the function is a relation, evaluate the function, and then graph
- Identify intervals on which a function increases, decreases, or is constant; locate relative maxima and minima; identify even or odd functions and their symmetry
- Calculate slope and write the equation of a line in point-slope form then graph
- Find slopes and equations of parallel and perpendicular lines
- Translate a graph given a function
- Combine, form, and write composite functions
- Verify, find, and graph inverse functions
- Find the distance between two points, the midpoint of a line, and the center and radius of a circle in standard form
- Construct functions from verbal descriptions and formulas

Core Activities: Students will complete/participate in the following:

- Model concepts
- Guided and Independent practice
- Rate of change activity (population of the U.S. over the last decade, century, etc.)
- Graphing activities (ie: graph all the stages of transformation of a function)

Extensions:

- Creating the function given the transformations
- Compare graphs with classmates

Remediation:

- Review key concepts and examples from the lessons
- Study Island Activity (ie activity: 1c, 1g, 1h, 3e, 3f, 4b, 4c, 4i)
- Tutoring with math teacher or peer tutor
- Modified extensions

Instructional Methods:

- Direct instruction
- Notes on the board (smart board when available)
- Small group discussions

Materials & Resources:

- Textbook
- Multimedia
- Calculators
- Worksheets

Assessments:

- Homework Assignments
- Quizzes and Tests
- Observations

Curriculum Scope & Sequence

Planned Course: Algebra 3

Unit: Polynomials and Rational Functions

Time frame: 11 – 14 Blocks

State Standards: 2.1.11.A, 2.2.11.C, 2.5.11.A, 2.5.11.B, 2.8.11.B, 2.8.11.C, 2.8.11.D, 2.8.11.E, 2.8.11.F

Anchor(s) or adopted anchor: M11.A.1, M11.A.2, M11.A.3, M11.D.1, M11.D.2, M11.D.4

Essential content/objectives: At the end of the unit, students will be able to:

- Perform operations with complex and imaginary numbers
- Graph and solve problems involving quadratic functions
- Identify and find all the zeros of a polynomial and their multiplicities
- Use the synthetic division and the Factor Theorem to solve a polynomial equation
- Graph all rational functions
- Solve polynomial and rational inequalities
- Solve problems involving direct, inverse, or combined variation problems

Core Activities: Students will complete/participate in the following:

- Model concepts
- Guided and Independent practice
- Write your own function activity (ie: based on something in your life)
- Graphing activities (ie: graph all the stages of transformation of a function)
- Group work

Extensions:

- Find the equation of a graph given only the graph
- Find the equation of the polynomial given only the zeros
- Alternate worksheet with more challenging problems

Remediation:

- Review of notes and example problems to reinforce lesson concepts
- Study Island Activity (ie activity: 1a, 1h, 4b, 4e, 4f, 4g)
- Tutoring with math teacher or peer tutor

Instructional Methods:

- Direct instruction
- Notes on the board (smart board when available)
- Small group discussions

Materials & Resources:

- Textbook
- Multimedia
- Calculators
- Worksheets

Assessments:

- Homework Assignments
- Quizzes and Tests
- Observations

Curriculum Scope & Sequence

Planned Course: Algebra 3

Unit: Exponential and Logarithmic Functions

Time frame: 12 – 15 Blocks

State Standards: 2.1.11.F, 2.2.11.C, 2.5.11.A, 2.5.11.B, 2.8.11.B, 2.8.11.C, 2.8.11.D, 2.8.11.E, 2.8.11.F, 2.11.11.B

Anchor(s) or adopted anchor: M11.A.1, M11.A.2, M11.D.1, M11.D.2, M11.D.4

Essential content/objectives: At the end of the unit, students will be able to:

- Evaluate and graph exponential functions
- Evaluate and graph logarithmic functions
- Use the properties of logarithms to condense or expand expression
- Use the properties of exponentials and logarithms to solve the equations
- Model exponential growth and decay

Core Activities: Students will complete/participate in the following:

- Model concepts
- Guided and Independent practice
- Graphing all the translations when graphing exponentials and logarithms
- Name that Model (activity to allow the students practice recognizing growth or decay)
- Group work

Extensions:

- Find the equation of an exponential or logarithmic expression graph given only the graph
- Given a set of data, write the correct model using base e
- Alternate worksheet with more challenging problems
- Explaining in more detail to peers in a small group

Remediation:

- Review of notes and example problems to reinforce lesson concepts
- Tutoring with math teacher or peer tutor

Instructional Methods:

- Direct instruction
- Notes on the board (smart board when available)
- Small group discussions

Materials & Resources:

- Textbook
- Multimedia
- Calculators
- Worksheets

Assessments:

- Homework Assignments
- Quizzes and Tests
- Observations