Pre-Calculus

Implement start year – 2014-2015

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Unit #1, Simplifying and Solving Equations
Transfer Goal: Students will be able to independently use their learning to simplify and solve various types of equations.

Stage 1 – Desired Results

Established Goals

2009 NJCCC Standard(s), Strand(s)/CPI #
(http://www.nj.gov/education/cccs/2009/final.htm)

Common Core Curriculum Standards for Math and English
(http://www.corestandards.org/)

Arithmetic with Polynomials and Rational Expression A-APR: 1, 2, 3

- Perform arithmetic operations on polynomials
- Understand the relationship between zeros and factors of polynomials

Reasoning with Equations and Inequalities HAS-REI.B.4a, b

- Solve equations and inequalities in one variable

Building Functions HSF-BF.A.1 1c, HSSF-BF.B.4 4b

- Build a function that models a relationship between two quantities
- Find inverse functions

Linear, Quadratic, and Exponential Models HSF-LE.A.4 4

- Construct and compare linear, quadratic, and exponential models and solve problems.

21st Century Themes
(www.21stcenturyskills.org)

☒ Global Awareness
☒ Financial, Economic, Business and Entrepreneurial Literacy
☐ Civic Literacy
☒ Health Literacy
☒ Environmental Literacy

21st Century Skills

Learning and Innovation Skills:
☒ Creativity and Innovation
☒ Critical Thinking and Problem Solving
☒ Communication and Collaboration

Information, Media and Technology Skills:
☒ Information Literacy
☒ Media Literacy
☒ICT (Information, Communications and Technology) Literacy

Life and Career Skills:
☒ Flexibility and Adaptability
☒ Initiative and Self-Direction
☒ Social and Cross-Cultural Skills
☒ Productivity and Accountability
☒ Leadership and Responsibility

Enduring Understandings:	**Essential Questions:**
Students will understand that . . . *EU 1* • Mathematics is a language consisting of symbols and rules. *EU 2* • There is more than one way to represent expressions. *EU 3* • Characteristics of functions can be used to model real life situations.	*EU 1* How do symbols and operational rules influence how expressions/equations are simplified and solved in mathematics? *EU 2* Why is it necessary to represent expressions in multiple ways? *EU 3* What characteristics of functions can help you analyze real world situations?
Knowledge: *Students will know . . .* *EU 1* The different symbols used to communicate a variety of concepts in simplifying and solving equations *EU 2* Substitution is a useful method for representing more than one expression. *EU 3* Simplifying and solving expressions/equations is a useful tool for modeling real life situations.	**Skills:** *Students will be able to . . .* *EU 1* Apply the appropriate symbols or rules to simplify or solve exponential expressions/equations, logarithmic expressions/equations, rational expressions/equations, quadratic expressions/equations *EU 2* Substitute an exponential expression for a log expression or vice versa. Compose functions *EU 3* Simplify and solve exponential, logarithmic, rational, and quadratic expressions/ equations

Stage 2 – Assessment Evidence

Performance Task 1: Car Depreciation *EU 1, EU 3*

Other Recommended Evidence: *Tests, Quizzes, Prompts, Self-assessment, Observations, Dialogues, etc.*

Quiz on simplifying, factoring, and solving polynomial functions
Quiz on simplifying and solving rational expressions and equations, rewriting absolute value inequalities in interval notion.
Quiz on composing functions, finding and verify inverses of functions
Quiz on solving exponential and logarithmic equations.
Assessed elements from recommended performance task.

Stage 3 – Learning Plan

Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: *Consider the WHERETO elements. Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer.*

Activity #1: Give each student an index card with either a polynomial equation in factored form, a polynomial equation in standard form, or the solutions to a polynomial equation. Students must find their "triplets". (A)

- Activity #2: Given 8-10 absolute value inequalities students must determine the solutions in interval notation. (M)

Activity #3: Give students real life situations and have the students match them with the best mathematical model. (T)