



Algebra 2 UNIT PLANNER



Unit title	Operations with Polynomials (DOE Unit 2)	Unit duration	4 weeks
Essential Questions (OR GUIDING QUESTIONS?)			
<ul style="list-style-type: none"> • How can we write a polynomial in standard form? • How can we write a polynomial in factored form? • How do we add, subtract, multiply, and divide polynomials? • In which operations does closure apply? 			
Assessments			
Common Formative Assessment – Quiz, operations; Ticket out the Door: composition			
Common Summative Assessment – Unit Assessment			
Content Standards			
Perform arithmetic operations on polynomials			
MGSE9-12.A.APR.1 Add, subtract, and multiply polynomials; understand that polynomials form a system analogous to the integers in that they are closed under these operations.			
Use polynomial identities to solve problems MGSE9-12.A.APR.4 Prove polynomial identities and use them to describe numerical relationships. <i>For example, the polynomial identity $(x^2 + y^2)^2 = (x^2 - y^2)^2 + (2xy)^2$ can be used to generate Pythagorean triples.</i>			
MGSE9-12.A.APR.5 Know and apply that the Binomial Theorem gives the expansion of $(x + y)^n$ in powers of x and y for a positive integer n , where x and y are any numbers, with coefficients determined using Pascal’s Triangle.			
Rewrite rational expressions MGSE9-12.A.APR.6 Rewrite simple rational expressions in different forms using inspection, long division, or a computer algebra system; 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 $b(x)$. —Will be covered in DOE Unit 3: Polynomial Functions			
Build a function that models a relationship between two quantities MGSE9-12.F.BF.1 Write a function that describes a relationship between two quantities.			
MGSE9-12.F.BF.1b Combine standard function types using arithmetic operations in contextual situations (Adding, subtracting, and multiplying functions of different types).			
MGSE9-12.F.BF.1c Compose functions. <i>For example, if $T(y)$ is the temperature in the atmosphere as a function of height, and $h(t)$ is the height of a weather balloon as a function of time, then $T(h(t))$ is the temperature at the location of the weather balloon as a function of time.</i>			
MGSE9-12.N.CN.8 Extend polynomial identities to include factoring with complex numbers. <i>For example, rewrite $x^2 + 4$ as $(x + 2i)(x - 2i)$ (Also covered in Unit 2 (DOE U1))</i>			
Build new functions from existing functions			

MGSE9-12.F.BF.4 Find inverse functions.

MGSE9-12.F.BF.4a Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse. For example, $f(x) = 2(x^3)$ or $f(x) = (x+1)/(x-1)$ for $x \neq 1$.

MGSE9-12.F.BF.4b Verify by composition that one function is the inverse of another.

MGSE9-12.F.BF.4c Read values of an inverse function from a graph or a table, given that the function has an inverse.

Learning Activities and Experiences

Topic	Resource	Content Covered	Standards Addressed
Operations on Polynomials (Function Notation)	3-2 Adding, Subtracting, and Multiplying Polynomials Pearson enVision pg. 139 - 145	<ul style="list-style-type: none"> Add, subtract, and multiply polynomials and understand that polynomials are closed under these operations Compare a polynomial function represented algebraically with one represented graphically. 	<p>MGSE9-12.A.APR.1 MGSE9-12.F.BF.1</p>
	5-5 Function Operations Pearson enVision pg. 273 - 280	<ul style="list-style-type: none"> Combine functions by addition, subtraction, multiplication or division, and identify the domain of the result. Compose functions, specifying the order in which the functions are applied and describing the domain of the composition. 	<p>MGSE9-12.A.APR.1 MGSE9-12.A.APR.6 MGSE9-12.F.BF.1b MGSE9-12.F.BF.1c</p>
Identities & Binomial Theorem	3-3 Polynomial Identities Pearson enVision pg. 146 - 153	<ul style="list-style-type: none"> Prove polynomial identities and use them to multiply and factor polynomials. Expand binomials using the Binomial Theorem and coefficients determined by Pascal's Triangle. 	<p>MGSE9-12.A.APR.4 MGSE9-12.A.APR.5 MGSE9-12.F.IF.8 MGSE9-12.N.CN.8</p>
	5-6 Inverse Relations and Functions	<ul style="list-style-type: none"> Find the inverse of functions. Verify inverses by function Composition 	<p>MGSE9-12.F.BF.4 MGSE9-12.F.BF.4a MGSE9-12.F.BF.4b MGSE9-12.F.BF.4c</p>
	Additional Resources:	<ul style="list-style-type: none"> DOE Framework Tasks - What's your identity?; A sum of functions; Combining and describing functions; Cardboard Box; Classifying polynomials; Rewriting Rational Expressions 	

Personalized Learning and Differentiation

Teachers differentiate by providing examples (work samples or task-specific clarifications of assessment criteria); structuring support (advance organizers, flexible grouping, peer relationships); establishing flexible deadlines, and adjusting the pace.

-SWD/504- Accommodations provided

-ELL- Five Principle ELL Curriculum Framework and Vocabulary Supports

-Intervention Support- Reteaching Activities in Small Groups with Progress Monitoring
-Extensions- Enrichment Tasks and Projects

Resources

DOE Curriculum Framework
Savvas Textbook Resources
Algebra 2 Schoology PLC Resources