Unit Title	Radically Rational			Length of Unit	3 weeks

Focusing Lens(es)	Transformations Structure	Standards and Grade Level Expectations Addressed in this Unit	MA10-GR.HS-S.1-GLE.1 MA10-GR.HS-S.2-GLE.3 MA10-GR.HS-S.2-GLE.4
Inquiry Questions (Engaging-Debatable):	• How are the models of rational and radical equations related? • Can the graphs of rational and radical functions be transformed in the same way as quadratic and linear functions?		
Unit Strands	Number and Quantity: The Real Number System Algebra: Reasoning with Equations and Inequalities Algebra: Arithmetic and Polynomials and Rational Expressions		
Concepts	properties of operations, rational expressions, rational equations, radical equations, properties of integer exponents, properties of rational exponents		

Generalizations My students will **Understand** that…	Guiding Questions	
	Factual	**Conceptual**
Properties of operations transform rational expressions with the intention of creating more efficient forms of the expression. (MA10-GR.HS-S.2-GLE.3-EO.g)	How can inspection, long division and computer algebra systems be used to rewrite rational expressions? How do you use factoring to rewrite a rational expression?	Why do we rewrite rational expressions in different forms? Why can computers solve problems that humans cannot? (MA10-GR.HS-S.2-GLE.4-IQ.3)
Solving rational and radical equations can result in extraneous solutions. (MA10-GR.HS-S.2-GLE.4-EO.b.ii)	How do you check for extraneous solutions? When do extraneous solutions arise? How can you determine if a solution is not viable?	Why do extraneous solutions occur?
The properties of integer exponents extend to rational exponents. MA10-GR.HS-S.1-GLE.1-EO.a)	What are the properties of exponents? What is the relationship between rational exponents and radicals? How can properties of exponents be used to transform rational expressions into radical expressions or vice versa? How are radical expressions simplified?	Why do we need both radicals and rational exponents?

Key Knowledge and Skills: My students will…	*What students will know and be able to do are so closely linked in the concept-based discipline of mathematics. Therefore, in the mathematics samples what students should know and do are combined.*

- Rewrite simple rational expressions in different forms; 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 $b(x)$, using inspection, long division, or, for the more complicated examples, a computer algebra system. (MA10-GR.HS-S.2-GLE.3-EO.g)
- Explain each step in solving simple rational or radical equations as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution and construct a viable argument to justify a solution method. (MA10-GR.HS-S.2-GLE.4-EO.b.i)
- Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise. (MA10-GR.HS-S.2-GLE.4-EO.b.ii)
- Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents. (MA10-GR.HS-S.1-GLE.1-EO.a.i)
- Rewrite expressions involving radicals and rational exponents using the properties of exponents. (MA10-GR.HS-S.1-GLE.1-EO.a.ii)

Critical Language: includes the Academic and Technical vocabulary, semantics, and discourse which are particular to and necessary for accessing a given discipline.	
EXAMPLE: A student in Language Arts can demonstrate the ability to apply and comprehend critical language through the following statement: *"Mark Twain exposes the hypocrisy of slavery through the use of satire."*	
A student in _____ can demonstrate the ability to apply and comprehend critical language through the following statement(s):	*I can factor the expressions in the numerator and denominator in order to simplify a rational expression.*
Academic Vocabulary:	rewrite, equality, solve, explain, definition, meaning, extending
Technical Vocabulary:	rational expression radical expressions, radical equation, rational equation, extraneous solution, rational exponents, properties of integer exponents, properties of rational exponents, radicals, inspection, long division, quotient, remainder, divisor, polynomial, properties of operations, degree of polynomial