

**Davison Community Schools
ADVISORY CURRICULUM COUNCIL
Alt Ed Math Topics
Phase II , April 1, 2012**

<i>Math Topics</i>	
Course Essential Questions (from Phase I report):	
1. How do we use mathematics to analyze, describe and communicate mathematical relationships and patterns?	
Unit 1: Decimals, Fractions and Percentages	
Essential Questions:	Essential Understanding:
1. What is the relationship between decimals, fractions and percentages?	<ul style="list-style-type: none"> • A percent is hundredths. • A fraction is a number on a number line. • A fraction bar means divide. • 'Of' means multiply • 'Is' means equals
Curriculum Standards	
4th grade – Number Systems – Fractions - Understand decimal notation for fractions, and compare decimal fractions.	
6. Use decimal notation for fractions with denominators 10 or 100. <i>For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.</i>	
Knowledge/Content	Skills/Processes
Students will know about....	Students will be able to.....
<ul style="list-style-type: none"> • The difference between fractions, decimals, and percents. • The steps of finding percent of increase and decrease. • The steps of finding the percent of a number. 	<ul style="list-style-type: none"> • Convert Percents to decimals • Convert Percents to fractions • Convert Decimals to fractions • Convert Decimals to percents • Convert Fractions to decimals • Convert Fractions to percents • Finding Percent of Increase and Decrease • Set up an equation to find a percent or whole number of a percent.
Phase III Textbook/Materials	
Phase IV Summative Assessment Evidence	
Common Summative Unit Assessments:	Agreed Upon Interim Summative Assessments: (*identifies Performance Task)
Phase V Learning Plan	

Unit 2: Solving Linear Equations	
<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. Which properties are used to solve an equation? 2. How are methods for solving inequalities similar/different to those of solving equations? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Students will solve equations, including equations with variables on both sides, using properties of equality. • The same properties for solving equations hold for inequalities with the addition of reversing the inequalities symbol when multiplying or dividing by a negative.
Curriculum Standards	
<p>Number and Quantity – (Quantities) Reason quantitatively and use units to solve problems.</p> <ol style="list-style-type: none"> 1. Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays. 	
<p>Algebra – (Creating Equations) Create equations that describe numbers or relationships</p> <ol style="list-style-type: none"> 1. Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i> 	
<p>(Reasoning with Equations and Inequalities) Understand solving equations as a process of reasoning and explain the reasoning</p> <ol style="list-style-type: none"> 1. Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. 	
<p>Solve equations and inequalities in one variable</p> <ol style="list-style-type: none"> 3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. 	
Knowledge/Content	Skills/Processes
<p>Students will know about....</p> <ul style="list-style-type: none"> • What properties are used when solving equations • Definition of inverse operations • Steps to solve equations • Rules of and Solving Inequalities 	<p>Students will be able to.....</p> <ul style="list-style-type: none"> • Solve two step equation • Use the distributive property to solve equation • C.L.T. to solve equation • Solve equation with variables on both sides • Solve inequalities, compounds equations and inequalities.
Phase III Textbook/Materials	
Phase IV Summative Assessment Evidence	
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Unit 3: Properties of Exponents

<p>Essential Questions:</p> <ol style="list-style-type: none"> 1. What are the properties of exponents and how are they used? 	<p>Essential Understanding:</p> <ul style="list-style-type: none"> • Product Rule: When bases are the same and being multiplied, keep the base and add the exponents • Quotient Rule: When bases are the same and being divided, keep the base and subtract the exponents. • Power Rule: When there is a power taken to a power, multiply the exponents.
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Curriculum Standards

Number and Quantity – (Real Numbers) Extend the properties of exponents to rational exponents.

1. 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. *For example, we define $5^{1/3}$ to be the cube root of 5 because we want $(5^{1/3})^3 = 5^{(1/3)3} = 5^1$ to hold, so $(5^{1/3})^3$ must equal 5.*
2. Rewrite expressions involving radicals and rational exponents using the properties of exponents.

Algebra – (Seeing Structure in Expressions) Interpret the structure of expressions

1. Interpret expressions that represent a quantity in terms of its context.*
 - a. Interpret parts of an expression, such as terms, factors, and coefficients.
 - b. Interpret complicated expressions by viewing one or more of their parts as a single entity. *For example, interpret $P(1+r)^n$ as the product of P and a factor not depending on P .*
2. Use the structure of an expression to identify ways to rewrite it. *For example, see $x^4 - y^4$ as $(x^2)^2 - (y^2)^2$, thus recognizing it as a difference of squares that can be factored as $(x^2 - y^2)(x^2 + y^2)$.*

(Arithmetic with Polynomials and Rational Expressions) Perform arithmetic operations on polynomials

1. Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.

Knowledge/Content	Skills/Processes
<p>Students will know about....</p> <ul style="list-style-type: none"> • Properties of exponents: <ul style="list-style-type: none"> ○ Product of Powers: $a^m \times a^n = a^{m+n}$ ○ Power of a Power: $(a^m)^n = a^{mn}$ ○ Power of a Product: $(ab)^m = a^m \cdot b^m$ ○ Negative Exponent: $a^{-m} = 1 / (a^m); a \neq 0$ ○ Zero Exponent: $a^0 = 1; a \neq 0$ ○ Quotient of Powers: $a^m / a^n = a^{m-n}; a \neq 0$ ○ Powers of a Quotient: $(a/b)^m = a^m / b^m; b \neq 0$ 	<p>Students will be able to.....</p> <ul style="list-style-type: none"> • Simplify expressions with zero and negative exponents • Multiply powers • Raise a power to a power • Raise a product to a power • Divide powers with the same base

Phase III Textbook/Materials

Phase IV Summative Assessment Evidence

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Phase V Learning Plan

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Unit 4: UPSL (Understand, Plan, Solve and Look back)	
Essential Questions: 1. How does UPSL(Problem Solving Steps: Understand, Plan, Solve and Lookback.) assist in solving word problems?	Essential Understanding: <ul style="list-style-type: none"> Students will be able to read a word problem and translate it into algebraic symbols by using key words and check solutions for reasonableness.
Curriculum Standards	
Algebra – (Creating Equations) Create equations that describe numbers or relationships 1. Create equations and inequalities in one variable and use them to solve problems. <i>Include equations arising from linear and quadratic functions, and simple rational and exponential functions.</i>	
Knowledge/Content	Skills/Processes
Students will know about....	Students will be able to.....
<ul style="list-style-type: none"> Keys words have algebraic symbols, such as... “Of” means multiply, increase, decrease. The Process of UPSL 	<ul style="list-style-type: none"> Solve word problems using UPSL.
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