MATHEMATICS

Foundations of Algebra Teaching & Learning Framework

Semester 1-Block Schedule

Module 1 2 weeks	Module 2 3 weeks	Module 3 3 weeks	Module 4 5 weeks	Module 5 5 weeks
Number Sense & Quantity	**Arithmetic to Algebra**	**Proportional Reasoning**	**Equations & Inequalities**	**Quantitative Reasoning with Functions**
MFANSQ1 Relationships (4 operations; multiples of fractions; multiple/divide by powers of ten with decimals; compare fractions/decimals) **MFANSQ2 +/-** (Real number+- on a number line & the meaning of zero) **MFANSQ3 Irrationals** (Irrational number approximations; adding & multiplying with rational & irrational numbers) **MFANSQ4 Computation** (Compute multi-digit decimals; compute with rational numbers; division of fractions by fractions; multi-step problems with any form of rational number)	**MFAAA1 Equivalent Expressions** (Commutative & distributive properties; numerical & algebraic expressions; add, subtract & multiply algebraic expressions; equivalent expressions; evaluate formulas) **MFAAA2 Exponents** (integer exponents; formulas; square & cube roots; Pythagorean Theorem) **Algebra Unit 3:** **Investigating Rational and Irrational Numbers** **A.NR.5** **A.NR.5.1** (Simplify radicals) **A.NR.5.2** (Explain irrational sums and products)	**MFAPR1 Equivalent Ratios** (Equivalent ratios) **MFAPR2 Proportions** (Fraction equivalence & division; percent problems) **MFAPR3 Graphing** (Unit rates as slope; similar triangles and slope; compare proportions in multiple representations)	**MFAEI1 One Variable** (Solve equations & inequalities & justify solutions) **MFAEI2 Units** (Scale, units, graphing) **MFAEI3 Two Variables** (Algebraic models; graphing calculators; systems of equations) **MFAEI4 Literal Equations** (Solve for a specific variable) **Algebra Unit 2:** **Analyzing Linear Inequalities** **A.PAR.4** **A.PAR.4.1** (Create, solve, and graph linear inequalities) **A.PAR.4.2** (Constraints of linear inequalities) **A.PAR.4.3** (Systems of linear inequalities)	**MFAQR1 Characteristics** (Domain & range) **MFAQR2 Compare & Graph** (Rates of change; linear & non-linear; key features; compare with multiple representations) **MFAQR3 Construct & Interpret** (Write; variables in context; function notation) **Algebra Unit 1:** **Modeling Linear Functions** **A.FGR.2** **A.FGR.2.1** (Arithmetic sequences) **A.FGR.2.2** (Construct and interpret linear functions) **A.FGR.2.3** (Domain and range) **A.FGR.2.4** (Function notation) **A.FGR.2.5** (Analyze linear and non-linear)

These units were written to build upon concepts from prior units, so later units contain tasks that depend upon the concepts addressed in earlier units.
All units will include the Mathematical Practices and indicate skills to maintain

NOTE: Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics
NSQ- number sense & quantity; **AA-** arithmetic to algebra; **PR-** proportional reasoning; **EI-** equations and inequalities; **QR-** quantitative reasoning with functions

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Algebra Teaching & Learning Framework

Semester 1			Semester 2-Block Schedule						
Foundations of Algebra Content Units 1-3			**Unit 4A** 3.5 weeks	**Unit 4B** 2.5 weeks	**Unit 5** 2 weeks	**Unit 6** 3 weeks	**Unit 7** 2 weeks	**Unit 8** 2 weeks	**Unit 9** 3 weeks
Modeling Linear Functions A.FGR.2	**Analyzing Linear Inequalities A.PAR.4**	**Investigating Rational and Irrational Numbers A.NR.5**	**Modeling and Analyzing Quadratic Expressions & Equations A.PAR.6**	**Modeling and Analyzing Quadratic Functions A.FGR.7**	**Modeling and Analyzing Exponential Expressions & Equations A.PAR.8**	**Analyzing Exponential Functions & Comparing Functions A.FGR.9**	**Investigating Data A.DSR.10**	**Algebraic Connections to Geometric Concepts A.GSR.3**	**Culminating Capstone Unit**
A.FGR.2.1 (Arithmetic sequences) **A.FGR.2.2** (Construct and interpret linear functions) **A.FGR.2.3** (Domain and range) **A.FGR.2.4** (Function notation) **A.FGR.2.5** (Analyze linear and non-linear)	**A.PAR.4.1** (Create, solve, and graph linear inequalities) **A.PAR.4.2** (Constraints of linear inequalities) **A.PAR.4.3** (Systems of linear inequalities)	**A.NR.5.1** (Simplify radicals) **A.NR.5.2** (Explain irrational sums and products)	**A.PAR.6.1** (Interpret quadratic expressions) **A.PAR.6.2** (Rewrite quadratic expressions) **A.PAR.6.3** (Create and solve quadratic equations) **A.PAR.6.4** (Constraints of quadratic equations)	**A.FGR.7.1** (Build and evaluate functions) **A.FGR.7.2** (Transformations) **A.FGR.7.3** (Analyze characteristics of quadratic functions) **A.FGR.7.4** (Domain and range) **A.FGR.7.5** (Rewrite quadratic functions to find max/min) **A.FGR.7.6** (Create and graph quadratic functions) **A.FGR.7.7** (Average rate of change) **A.FGR.7.8** (Write a quadratic function for different properties) **A.FGR.7.9** (Compare functions represented differently)	**A.PAR.8.1** (Interpret exponential expressions) **A.PAR.8.2** (Create exponential equations in one variable) **A.PAR.8.3** (Create exponential equations in two variables) **A.PAR.8.4** (Constraints of exponential equations)	**A.FGR.9.1** (Build and evaluate functions) **A.FGR.9.2** (Graph and analyze characteristics of exponential functions) **A.FGR.9.3** (Transformations) **A.FGR.9.4** (Geometric sequences) **A.FGR.9.5** (Compare functions represented differently)	**A.DSR.10.1** (Compare center and variability with appropriate statistics) **A.DSR.10.2** (Interpret shape, center, and variability) **A.DSR.10.3** (Represent data on a scatter plot) **A.DSR.10.4** (Interpret slope and y-intercept of linear model) **A.DSR.10.5** (Line of best fit and r) **A.DSR.10.6** (Choose appropriate function from data) **A.DSR.10.7** (Correlation vs. Causation)	**A.GSR.3.1** (Solve problems with slope, parallel and perpendicular lines, area, and perimeter) **A.GSR.3.2** (Apply distance formula, midpoint formula, and slope to solve problems)	**All standards**

Units contain tasks that depend upon the concepts addressed in earlier units. Mathematical standards are interwoven and should be addressed throughout the year in as many different units and tasks as possible in order to stress the natural connections that exist among mathematical topics.

The Framework for Statistical Reasoning, Mathematical Modeling Framework, and the K-12 Mathematical Practices should be taught throughout the units.

Key for Course Standards: MP: Mathematical Practices, MM: Mathematical Modeling, NR: Numerical Reasoning, FGR: Functional & Graphical Reasoning, AGR: Algebraic & Geometric Reasoning, GSR: Geometric & Spatial Reasoning, PAR: Patterning & Algebraic Reasoning, DSR: Data & Statistical Reasoning

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