



Algebra 2

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Hazelwood School District

Mission Statement

We are a collaborative learning community guided by a relentless focus to ensure each student achieves maximum growth.

Vision Statement

HSD will foster lifelong learners, productive citizens and responsible leaders for an ever-evolving society.

Board of Education on January 5, 2010

Goals

Goal #1: Hazelwood students will meet or exceed state standards in all curricular areas with emphasis in reading, writing, mathematics, science and social studies.

Goal #2: Hazelwood staff will acquire and apply skills necessary for improving student achievement.

Goal #3: Hazelwood School District, the community and all families will support the learning of all children.

Curriculum Overview

The HSD Algebra 2 curriculum has not been updated in more than 7 years. Since that time, mathematics standards, learning progressions and best practices informed by research has drastically changed. This rewrite is to comply with MSIP V and to help ensure that all HSD students are receiving a high quality mathematics education.

This course builds on the work from previous courses with linear, quadratic, and exponential functions, students extend their repertoire of functions to include polynomial, rational, and radical functions. Students work closely with the expressions that define the functions, and continue to expand and hone their abilities to model situations and to solve equations, including solving quadratic equations over the set of complex numbers and solving exponential equations using the properties of logarithms. The Mathematical Practice Standards apply throughout each course and, together with the content standards, prescribe that students experience mathematics as a coherent, useful, and logical subject that makes use of their ability to make sense of problem situations.

The purpose of Algebra 2 is to extend the base of Algebra I and be a bridge to further mathematical studies. It is a continuation of Algebra I with an introduction to imaginary numbers, radials, and extended practice in Algebra. It is a necessary class to higher mathematics and pre college testing. This subject provides the necessary mathematical tools for complex reasoning and solving problems in the sciences, technology, engineering, and many skilled trades and professions.

The curriculum contains unit assessments that are rigorous and outline clear expectations. As the curriculum is implemented and taught, the assessments will be revised. **The assessments are required;** the learning activities are suggested. Teachers are encouraged to select the learning activities which meet the needs of their students. Some of the learning activities are very sequential and, when all of them are used, a student should be able to successfully complete the unit assessment. Other activities provide a menu of suggestions, and the teacher should select from those offered or design his/her own.

The plan for professional development includes multiple opportunities for training to help ensure that the high school mathematics curricula are implemented effectively and with fidelity. Initial training will be provided during district professional development opportunities to cover content and pedagogy. In addition to professional development days, ongoing training will be provided during Professional Learning Community (PLC) meetings to assist with upcoming skills and nuances in learning objectives. The Mathematics District Curriculum Coach and District Coordinator will provide teachers training to familiarize them with curriculum

activities and expectations. Finally, ongoing training during PLC meetings will assist teachers with upcoming skills and with nuances in the learning objectives.

COURSE TITLE: Algebra 2

GRADE LEVEL: 9 – 12

CONTENT AREA: Mathematics

Course Description:

In Algebra 2, students work with real data, real-life situations, and real-world applications to realize the value of learning mathematics. This course incorporates investigations, experiments, and cooperative learning. Students approach traditional and contemporary algebra topics from many different perspectives, exploring concepts informally and intuitively before seeing algebra in its abstract, symbolic representations. Students use technology such as graphing calculators and computers, to explore problems, ideas, and concepts from different viewpoints. Explorations and investigations emphasize symbol sense, algebraic manipulations, and conceptual understanding. *Algebra 2* integrates algebra with geometry, statistics, data analysis, functions, probability, and trigonometry. This course prepares students for additional study of mathematics, science, and courses rich in data analysis and statistics, in high school and beyond. Algebra concepts include patterns and recursions, linear systems, rational, exponential, quadratic, and logarithmic functions, conic sections, and series.

Course Rationale:

Algebra 2 extends the base of Algebra 1 and provides students with a bridge to higher mathematics and pre college testing. This subject provides the necessary mathematical tools for complex reasoning and solving problems in the sciences, technology, engineering, and many skilled trades and professions.

Course Scope and Sequence

Unit 1: Polynomial Relationships and Complex Numbers (Approx. 25 class periods)	Unit 2: Polynomial, rational and radical relationships (Approx. 25 class periods)	Unit 3: Trigonometric Functions (Approx. 12 class periods)
Unit 4: Functions (Approx. 20 class periods)	Unit 5: Inferences and conclusions from data (Approx. 10 class periods)	

Essential Terminology/Vocabulary

Exponent, root, imaginary, complex, absolute value, modulus, conjugate, polynomial, term, base, conjugate, Factor, Special forms, function, expression, simplify, Term, Polynomial, binomial, expanded, factored, pascal, triangular numbers, Geometric, arithmetic, sequence, relation, equation, rational, remainder, polynomial function, long division, synthetic division, quotient, remainder, rational zeros theorem, complex conjugate theorem, fundamental theorem of algebra, factor and remainder theorem, binomial factor, inflection, crossing point, turning point, even multiplicity, odd multiplicity, even/odd functions, left/right behavior. pascal, triangular numbers, rational, remainder, exponential, logarithmic, Sine, cosine, tangent, central angle, reference angle, radius, hypotenuse, leg, theta, right triangle, unit circle, arc, radian, subtended, secant, cosecant, central angle, reference angle, unit circle, periodic, sinusoidal, parabola, quadratic, polynomial, rational, domain, range, population, S-curve, projectile motion, Central tendency, mean, median, mode, variance, deviation, standard deviation, normal distribution, bell curve, probability, independent event, dependent event,

Unit Objectives:

Unit 1: Polynomial Relationships and Complex Numbers

- Perform arithmetic operations with complex numbers
- Use complex numbers in polynomial identities and equations

Unit 2: Polynomial, Rational and Radical Relationships

- Interpret the structure of expressions
- Write expressions in equivalent forms to solve problems
- Perform arithmetic operations on polynomials
- Understand the relationship between zeroes and factors of polynomials
- Use polynomial identities to solve problems
- Rewrite rational expressions
- Understand solving equations as a process of reasoning and explain the reasoning
- Represent and solve equations and inequalities graphically
- Analyze functions using different representations

Unit 3: Trigonometric Functions

- Extend the domain of trigonometric functions using the unit circle
- Model periodic phenomena with trigonometric functions
- Prove and apply trigonometric identities

Unit 4: Functions

- Create equations that describe numbers or relationships
- Interpret functions that arise in applications in terms of a context
- Analyze functions using different representations
- Build a function that models a relationship between two quantities
- Build new functions from existing functions
- Construct and compare linear, quadratic, and exponential models and solve problems

Unit 5: Inferences and Conclusions from Data

- Summarize, represent and interpret data on single count or measurement variable
- Understand and evaluate random processes underlying statistical experiments
- Make inferences and justify conclusions from sample surveys, experiments and observational studies
- Use probability to evaluate outcomes of decisions

Proposed Course Materials and Resources:

Glencoe Algebra 2
McGraw-Hill Education
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