Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 2

Overview	Standards for Mathematical Content		Unit Focus	Standards for Mathematical Practice
Unit 2 **Properties of Numbers, Equations & Inequalities, and Geometry**	• A.CED.A.2 • A.CED.A.3 • A.REI.B.4b • A.REI.D.12 • A.REI.C.6 • A.SSE.B.3 • F.BF.A • F.IF.B.6 • F.IF.C.7	• F.LE.A.2 • F.LE A.1 • N.RN.B.3 • N.Q.A • G.SRT.A.2 • G.SRT.C.8 • G.GMD.A.3 • G.MG.A	• Classify numbers and concepts like divisibility, prime factorization, GCF, and LCM. • Perform computations and operations on integers, rational numbers, and irrational numbers. • Understand properties of the real number system. • Understand and use properties of exponents. • Use arithmetic and geometric sequences to solve problems. • Solve and graph linear equations and inequalities. • Solve and graph systems of equations and inequalities. • Apply functions and use functions to solve problems. • Solve quadratic equations by graphing, factoring, and the quadratic formula while understanding the uses/practicality of each method of solving. • Convert within the metric system. • Understand units of length, area, and volume in the metric system. • Understand mass and temperature in the metric system, and convert between Fahrenheit and Celsius. • Understand and use dimensional analysis. • Understand and apply concepts of points, lines, planes, and angles to solve problems. • Solve problems involving polygons and similar or congruent figures. • Use geometric formulas, theorems, and conversions. • Perform and identify geometric transformations. • Understand topological equivalence.	MP.1 Make sense of problems and persevere in solving them. MP.2 Reason abstractly and quantitatively. MP.3 Construct viable arguments and critique the reasoning of others. MP.4 Model with mathematics. MP.5 Use appropriate tools strategically. MP.6 Attend to precision. MP.7 Look for and make use of structure. MP.8 Look for and express regularity in repeated reasoning.
Unit 2: Suggested Open Educational Resources	A.CED.A.2 Clea on an Escalator A.CED.A.3 Dimes and Quarters A.REI.B.4 Braking Distance A.REI.C.6 Cash Box A.REI.D.12 Fishing Adventures 3 A.SSE.B.3 Ice Cream		F.BF.A.1a Skeleton Tower F.IF.B.6 Temperature Change F.IF.C.7b Bank Account Balance F.LE.A.1 Finding Linear and Exponential Models F.LE.A.2 Interesting Interest Rates N.RN.B.3 Operations with Rational and Irrational Numbers	N.Q.A.1 How Much Is a Penny Worth? G.SRT.A.2 Similar Quadrilaterals G.SRT.C.8 Neglecting the Curvature of the Earth G.GMD.A.3 Doctor's Appointment G.MG.A.3 Ice Cream Cone

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Curriculum Unit 2	Standards		Pacing	
			Days	Unit Days
Unit 2 **Modeling with Linear Functions, Linear Systems, & Exponential Functions**	A.CED.A.2 A.CED.A.3 A.REI.B.4b A.REI.C.6 A.REI.D.12 A.SSE.B.3	• Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales. • Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods. • Solve quadratic equations by inspection (e.g., for x2 = 49), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions and write them as a ± bi for real numbers a and b. • Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables. • Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes. • Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.	12	45
	F.LE A.1 F.LE.A.2 F.BF.A.1 F.IF.B.6 F.IF.C.7	• Distinguish between situations that can be modeled with linear functions and with exponential functions. • Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table). • Write a function that describes a relationship between two quantities. • Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval. Estimate the rate of change from a graph. • Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.	12	
	N.RN.B.3 N.Q.A	• Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational. • Reason quantitatively and use units to solve problems.	5	
	G.SRT.A.2 G.SRT.C.8 G.GMD.A.3 G.MG.A	• Given two figures, use the definition of similarity in terms of similarity transformations to decide if they are similar; explain using similarity transformations the meaning of similarity for triangles as the equality of all corresponding pairs of angles and the proportionality of all corresponding pairs of sides. • Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems. • Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems. • Apply geometric concepts in modeling situations.	11	
	Assessment, Re-teach and Extension		5	

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Unit 2 Algebra III/Trigonometry	
School/District Formative Assessment Plan	**School/District Summative Assessment Plan**
Pre-Assessment, Quizzes Exit Tickets Daily Monitoring	Unit Benchmark SAT Testing ACT Testing
District/School Tasks	**District/School Primary and Supplementary Resources and Technology Integration**
NJDOE Digital Item Library https://nj.digitalitemlibrary.com/home **NJSLA Mathematics Evidence Statements** https://docs.google.com/spreadsheets/d/18M5r1jk4P729fTpAlWAzrw1gE6tken233I-Yk0U712M/edit#gid=554025491	**Textbook** **Khan Academy** https://www.khanacademy.org/ **NJSLA Resources:** https://nj.mypearsonsupport.com/practice-tests/math/ **Diversity, Equity & Inclusion Educational Resources** https://www.nj.gov/education/standards/dei/
Instructional Best Practices and Exemplars	
1. Identifying similarities and differences 2. Summarizing and note taking 3. Reinforcing effort and providing recognition 4. Homework and practice 5. Nonlinguistic representations	6. Cooperative learning 7. Setting objectives and providing feedback 8. Generating and testing hypotheses 9. Cues, questions, and advance organizers 10. Manage response rates

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Vocabulary					
Prime number	Associative property	Constant	Inequality	Objective function	Postulates/axioms
Composite number	Distributive property	Variable	Compound inequality	Polynomial	Theorem
Prime factorization	Sequence	Coefficient	Cartesian/rectangular coordinate system	Zero-Factor Property	Point
Greatest common divisor	Arithmetic sequence	Algorithm		Function	Line
Least common multiple	Common difference	Contradiction/no solution	Quadrants	Domain	Plane
Whole numbers	Geometric sequence	Identity/all real numbers	Collinear	Range	Angle
Integers	Common ratio	Formula	Slope	Exponential function	Vertex
Exponent	Golden number	Subscript	Independent variable	Natural exponential function	Adjacent
Rational numbers	Golden ratio	Proportion	Dependent variable		Complementary
Irrational numbers	Evaluate	Variation equation	System of linear equations	Growth or decay formula	Supplementary
Mixed number	Simplify	Direct variation		SI System	Transversal
Improper fraction	Solve	Constant of proportionality	Break-even analysis	US customary system	Interior/exterior angles
Reciprocal	Solution		Half-plane	Mass	Regular polygon
Closure/closed	Expression	Inverse variation	System of linear inequalities	Dimensional analysis	Similar
Commutative property	Equation	Joint variation		Unit fraction	Congruent
Constraints	Simplex method	Combined variation		Euclidean geometry	

9.1 Personal Financial Literacy, 9.2 Career Awareness, Exploration, Preparation and Training & 9.4 Life Literacies and Key Skill

9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
9.4.12.CI.3: Investigate new challenges and opportunities for personal growth, advancement, and transition (e.g., 2.1.12.PGD.1).
9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).
9.4.12.DC.6: Select information to post online that positively impacts personal image and future college and career opportunities.
9.4.12.TL.2: Generate data using formula-based calculations in a spreadsheet and draw conclusions about the data.
9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments.

The implementation of the 21st Century skills and standards for students of the Winslow Township District is infused in an interdisciplinary format in a variety of curriculum areas that include, English language Arts, Mathematics, School Guidance, Social Studies, Technology, Visual and Performing Arts, Science, Physical Education and Health, and World Language.

Additional opportunities to address 9.1, 9.2 & 9.4:
Philadelphia Mint
https://www.usmint.gov/learn/kids/resources/educational-standards
Different ways to teach Financial Literacy.
https://www.makeuseof.com/tag/10-interactive-financial-websites-teach-kids-money-management-skills/

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Suggested Modifications for Special Education/504	
Students with special needs: The students' needs will be addressed on an individual and grade level using a variety of modalities. Accommodations will be made for those students who need extra time to complete assignments. Support staff will be available to aid students related to IEP specifications. 504 accommodations will also be attended to by all instructional leaders. Physical expectations and modifications, alternative assessments, and scaffolding strategies will be used to support this learning. The use of Universal Design for Learning (UDL) will be considered for all students as teaching strategies are considered.	
☐ Provide the opportunity to re-take tests	☐ Individual Intervention/Remediation
☐Modify activities/assignments/projects/assessments	☐ Additional Support Materials
☐ Breakdown activities/assignments/projects/assessments into manageable units	☐ Guided Notes
☐Additional time to complete activities/assignments/projects/assessments	☐ Graphic Organizers
☐ Provide an option for alternative activities/assignments/projects/assessments	☐ Adjust Pacing of Content
☐ Modify Content	☐ Increase one on one time
☐ Modify Amount	☐ Peer Support
☐ Small Group Intervention/Remediation	☐ Other Modifications for Special Education:
Suggested Modifications for At-Risk Students	
Formative and summative data will be used to monitor student success. At first signs of failure, student work will be reviewed to determine support. This may include parent consultation, basic skills review and differentiation strategies. With considerations to UDL, time may be a factor in overcoming developmental considerations	
☐ Provide the opportunity to re-take tests	☐ Modify Content
☐ Increase one on one time	☐ Modify Amount
☐ Oral prompts can be given	☐ Adjust Pacing of Content
☐ Using visual demonstrations, illustrations, and models	☐ Small Group Intervention/Remediation
☐ Give directions/instructions verbally and in simple written format	☐ Individual Intervention/Remediation
☐ Peer Support	☐ Additional Support Materials
☐ Modify activities/assignments/projects/assessments	☐ Guided Notes
☐ Additional time to complete activities/assignments/projects/assessments	☐ Graphic Organizers
☐ Provide an option for alternative activities/assignments/projects/assessments	☐ Other Modifications for Students At-Risk:

Suggested for English Language Learners	Suggested Modifications for Gifted Students
All WIDA Can Do Descriptors can be found at this link: https://wida.wisc.edu/teach/can-do/descriptors ☐ Grades 9-12 WIDA Can Do Descriptors: ☐ Listening ☐ Speaking ☐ Reading ☐ Writing ☐ Oral Language Students will be provided with accommodations and modifications that may include: • Relate to and identify commonalities in mathematics studies in student's home country • Assist with organization • Use of computer • Emphasize/highlight key concepts • Teacher Modeling • Peer Modeling • Label Classroom Materials - Word Walls	Students excelling in mastery of standards will be challenged with complex, high level challenges related to the topic. • Raise levels of intellectual demands • Require higher order thinking, communication, and leadership skills • Differentiate content, process, or product according to student's readiness, interests, and/or learning styles • Provide higher level texts • Expand use of open-ended, abstract questions • Critical and creative thinking activities that provide an emphasis on research and in-depth study • Enrichment Activities/Project-Based Learning/ Independent Study Additional Strategies may be located at the links: ❖ Gifted Programming Standards ❖ Webb's Depth of Knowledge Levels and/or Revised Bloom's Taxonomy ❖ REVISED Bloom's Taxonomy Action Verbs

Suggested Activities	
☐ Do Now/Warm-Up	☐ Centers
☐ Whole Group	☐ Intervention/Remediation
☐ Small Groups	☐ Projects
☐ Guided Practice	☐Academic Games
☐ Independent Practice	☐ Other Suggested Activities:

Interdisciplinary Connections

Interdisciplinary Connections: ELA

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

NJSLSA.L1. Demonstrate command of the conventions of standard English grammar and usage when writing or speaking

SL.9-10.4: Present information, findings and supporting evidence clearly, concisely and logically. The content, organization, development and style are appropriate to task, purpose and audience.

NJSLSA.L6: Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when encountering an unknown term important to comprehension or expression.

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Integration of Computer Science and Design Thinking NJSLS 8
8.1.12.AP.1: Design algorithms to solve computational problems using a combination of original and existing algorithms. 8.1.12.AP.2: Create generalized computational solutions using collections instead of repeatedly using simple variables. 8.1.12.AP.8: Evaluate and refine computational artifacts to make them more usable and accessible. 8.1.12.AP.5: Decompose problems into smaller components through systematic analysis, using constructs such as procedures, modules, and/or objects. 8.1.12.DA.1: Create interactive data visualizations using software tools to help others better understand real world phenomena, including climate change. 8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena. 8.1.12.DA.6: Create and refine computational models to better represent the relationships among different elements of data collected from a phenomenon or process. 8.2.12.ETW.2: Synthesize and analyze data collected to monitor the effects of a technological product or system on the environment. 8.2.12.EC.3: Synthesize data, analyze trends, and draw conclusions regarding the effect of a technology on the individual, culture, society, and environment and share this information with the appropriate audience.