Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

Overview	Standards for Mathematical Content		Unit Focus	Standards for Mathematical Practice
Unit 3 **Matrices, Personal Finance, & Probability**	• F.BF.A.1 • F.IF.B.6 • F.LE.A.1 • G.SRT.A.2 • G.SRT.C.8 • G.GMD.A.3 • G.MG.A	• N.Q.A • S.CP.A • S.CP.B • S.IC.A.2 • S.MD.A • S.MD.B	• Describe non-Euclidean and fractal geometry. • Understand and identify mathematical systems. • Understand and use the commutative and associative properties. • Understand and identify closure, identity elements, and inverses. • Show whether a system is a group or a commutative group. • Determine whether a finite mathematical system without numbers is a group. • Solve problems involving modulo m systems and determine is a modulo m system is a commutative group. • Perform operations with matrices and show that matrices can be used to form a commutative group. • Convert between a percent, fraction, and decimal number. • Solve problems including percent change, percent markup and markdown, etc. • Use the simple interest formula and use the United States rule to solve simple interest problems. • Solve problems involving compound interest and the present value of an investment. • Solve problems involving fixed and open-ended installment loans. • Solve problems involving conventional and adjustable-rate mortgages. • Solve problems involving ordinary annuities, sinking funds, and retirement savings options. • Understand the nature of probability, the law of large numbers, and empirical and theoretical probabilities. • Understand odds in favor and odds against. • Understand how to obtain probabilities from odds and vice versa. • Determine expected value and fair price. • Understand/use the fundamental counting principle and construct tree diagrams. • Understand and solve probability problems that involve *and* and *or*. • Solve conditional probability problems. • Solve problems involving permutations (also of duplicate items).	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 3: Suggested Open Educational Resources	F.IF.B.6 Mathemafish Population F.BF.A.1 Compounding with 5% Interest F.LE.B.6 Basketball Bounces G.SRT.A.2 Are They Similar? G.SRT.C.8 Setting Up Sprinklers	G.GMD.A.3 The Great Egyptian Pyramids G.MG.A.1 Toilet Roll N.Q.A Giving Raises S.CP.A The Titantic	S.CP.B False Positive Test Results S.IC.A.2 Guess the Probability S.MD.A Bob's Bagel Shop S.MD.B Sounds Really Good! (sort of...)	

Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

Curriculum Unit 3	Standards		Pacing	
			Days	Unit Days
Unit 3 **Quadratic Equations, Functions & Polynomials**	F.BF.A.1 F.IF.B.6 F.LE.A.1	• 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. • Distinguish between situations that can be modeled with linear functions and with exponential functions.	13	45
	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.	13	
	N.Q.A	• Reason quantitatively and use units to solve problems.	3	
	S.CP.A S.CP.B S.IC.A.2 S.MD.A S.MD.B	• Understand independence and conditional probability and use them to interpret data. • Use the rules of probability to compute probabilities of compound events in a uniform probability model. • Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model? • Calculate expected values and use them to solve problems. • Use probability to evaluate outcomes of decisions.	11	
	Assessment, Re-teach and Extension		5	

Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

Unit 3 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

Vocabulary					
Perimeter Area Radius Diameter Circumference Volume Surface area Solid geometry Space figures Platonic solid Prism Right prism	Transformational geometry Rigid motion Reflection Translation/glide Rotation Symmetry Tessellation/tilling Topology Four-color theorem Genus Fractal geometry Chaos theory	Mathematical system Binary operation Group Modulo m system Matrix Dimensions Percent Percent change Credit Principal of the loan Cosigners Interest	Simple interest Rate Banker's rule Discount note Bank discount Partial payment United States rule Investment Fixed investment Variable investment Compound interest Annual yield	Loan Down payment Closing Gross/adjusted monthly income Amortization schedule Annuity Sinking fund IRA Experiment Outcomes Event Empirical probability	Law of large numbers Theoretical probability Odds Expectation Fundamental Counting Principle Sample space Tree diagram Mutually exclusive Independent events Conditional probability Permutation

9.1 Personal Financial Literacy, 9.2 Career Awareness, Exploration, Preparation and Training & 9.4 Life Literacies and Key Skills
9.1.12.CP.1: Summarize how one's credit history can affect finances, including loan terms, employment, and qualifying for loans. 9.1.12.CP.2: Identify the advantages of maintaining a positive credit history. 9.1.12.CP.3: Summarize factors that affect a positive credit rating, including on-time payments, debt versus available credit, length of open credit, and how often you apply for credit. 9.1.12.CP.4: Identify the skill sets needed to build and maintain a positive credit profile. 9.1.12.CP.5: Create a plan to improve and maintain an excellent credit rating. 9.1.12.CP.9: Analyze the information contained in a credit report, how scores are calculated and used, and explain the importance of disputing inaccurate entries. 9.1.12.PB.1: Explain the difference between saving and investing. 9.1.12.PB.6: Describe and calculate interest and fees that are applied to various forms of spending, debt and saving. 9.2.12.CAP.14: Analyze and critique various sources of income and available resources (e.g., financial assets, property, and transfer payments) and how they may substitute for earned income. 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.IML.7: Develop an argument to support a claim regarding a current workplace or societal/ethical issue such as climate change (e.g., NJSLSA.W1, 7.1.AL.PRSNT.4). 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/

Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

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:

Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

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 ☐ Whole Group ☐ Small Groups	☐ Guided Practice ☐ Independent Practice	☐ Centers ☐ Intervention/Remediation ☐ Projects	☐Academic Games ☐ 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.

Winslow Township School District

Mathematics Curriculum – Algebra III/Trigonometry

Unit 3

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.