

Course: SAT Prep MATH Unit #: Unit 3 - Passport to Advanced Math	Year of Implementation: 2023-2024
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Stage One - Desired Results	
Link(s) to New Jersey Student Learning Standards for this course: <i>{provide all applicable links to standards here}</i> https://www.state.nj.us/education/cccs/2020/	
● Unit Standards: <i>(keep each of the following headings in place)</i> ○ Content Standards ■ NJSLS F-IF-A.1-2. Understand the concept of a function and use function notation. ■ NJSLS F-IF-B.4-6. Interpret functions that arise in applications in terms of the context. ■ NJSLS F-IF-C.7-9. Analyze functions using different representations. ■ NJSLS F-BF- A.1-2. Build a function that models a relationship between two quantities. ■ NJSLS F-BF-B.3. Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them. ■ NJSLS F-LE-A.1-4 Construct and compare linear and exponential models and solve problems. ■ NJSLS F-LE-B.5 5. Interpret the parameters in a linear or exponential function in terms of a context. ○ 21st Century Life & Career Standards ■ 9.4.5.CT.1-4 The ability to solve problems effectively begins with gathering data, seeking resources, and applying critical thinking skills. ■ 9.4.8.CT.1- 3 Multiple solutions often exist to solve a problem. ■ 9.4.8.CT.1-3 An essential aspect of problem solving is being able to self-reflect on why possible solutions for solving problems were or were not successful. ■ 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas.	

<https://www.state.nj.us/education/cccs/2020/2020%20NJSL-CLKS.pdf>

- **English Companion Standards**

- RST.11-12.1. Accurately cite strong and thorough evidence from the text to support analysis of science and technical texts, attending to precise details for explanations or descriptions.
- RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.
- RH.11-12.7. Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., visually, quantitatively, qualitatively, as well as in words) in order to address a question or solve a problem.

https://www.nj.gov/education/standards/ela/Docs/2016NJSL-ELA_Companion11-12.pdf

- **NJ Statutes:** NJ State law mandates the inclusion of the following topics in lesson design and instruction as aligned to elementary and secondary curriculum.

Amistad Law: N.J.S.A. 18A 52:16A-88 Every board of education shall incorporate the information regarding the contributions of African-Americans to our country in an appropriate place in the curriculum of elementary and secondary school students.

Holocaust Law: N.J.S.A. 18A:35-28 Every board of education shall include instruction on the Holocaust and genocides in an appropriate place in the curriculum of all elementary and secondary school pupils. The instruction shall further emphasize the personal responsibility that each citizen bears to fight racism and hatred whenever and wherever it happens.

LGBT and Disabilities Law: N.J.S.A. 18A:35-4.35 A board of education shall include instruction on the political, economic, and social contributions of persons with disabilities and lesbian, gay, bisexual, and transgender people, in an appropriate place in the curriculum of middle school and high school students as part of the district's implementation of the New Jersey Student Learning Standards (N.J.S.A. 18A:35-4.36) A board of education shall have policies and procedures in place pertaining to the selection of instructional materials to implement the requirements of N.J.S.A. 18A:35-4.35.

Diversity and Inclusion ([N.J.S.A. 18A:35-4.36a](#)) A board of education shall incorporate instruction on diversity and inclusion in an appropriate place in the curriculum of students in grades kindergarten through 12 as part of the district's implementation of the New Jersey Student Learning Standards.

Asian American and Pacific Islanders (AAPI) [P.L.2021, c.410](#) Ensures that the contributions, history, and heritage of Asian Americans and Pacific Islanders (AAPI) are included in the New Jersey Student Learning Standards (NJSLS) for Social Studies in kindergarten through Grade 12 (P.L.2021, c.416)

For additional information, see

NJ Amistad Curriculum: <http://www.njamistadcurriculum.net/>

Diversity and Inclusion: <https://www.nj.gov/education/standards/dei/index.shtml>

- (Sample Activities/ Lessons): <https://www.nj.gov/education/standards/dei/samples/index.shtml>

Asian American and Pacific Islanders:

- [Asian American and Pacific Islander Heritage and History in the U.S.](#)

A Teacher's Guide from EDSITEment offering a collection of lessons and resources for K-12 social studies, literature and arts classrooms that center around the experiences, achievements and perspectives of Asian Americans and Pacific Islanders across U.S. history.

Transfer Goal: Students will be able to independently use their learning to understand the structure of expressions and the ability to analyze, manipulate, and rewrite these expressions while demonstrating reasoning of more complex problems.

As aligned with LRHSD Long Term Learning Goal(s):

1. *Problem-Solving: apply and transfer autonomously and collaboratively mathematical concepts and problem- solving techniques to unfamiliar, varied and real-world situations*
2. *Reasoning: reason abstractly and quantitatively by applying mathematical representations, symbols and estimation techniques when engaging in problem-solving*
3. *Critical Thinking: construct and effectively communicate valid conclusions and critique the reasoning of others*
4. *Modeling: demonstrate mastery of concepts by evaluating models that others have constructed or by creating appropriate models of their own*
5. *Tools: identify the correct tools to solve problems, if applicable*
6. *Precision: determine an answer's appropriateness as a means of determining its validity, while using proper mathematical notation and units*
7. *Structure: use multiple representations, critical thinking skills, and prior knowledge to solve problems in new situations*
8. *Patterns: analyze data and recognize patterns in a variety of situations*
9. *Habits of Mind: approach new situations with curiosity, persistence, resourcefulness, and confidence; take risks, monitor their progress, accept and learn from setbacks, make adjustments, and reflect on their performance*

Enduring Understandings

Students will understand that. . .

EU 1

Using structure and reasoning can help you solve challenging questions

Essential Questions

EU 1

- How can solving equations and systems of equations be used to solve real world problems?
- How can creating expressions, equations and inequalities be used to solve real world problems?
- Why is it important to interpret solutions?
- How will systems of equations and inequalities be used to answer real world questions?

EU 3

- *linear equations and systems can be represented graphically*
- *changing parts of an equation and/or system can affect its graph*

EU 3

- Interpret solutions in context of the problem
- graph all types of linear equations and systems in the coordinate plane
- describe the changes on the graphs of all linear equations and systems when the original equations are changed

Stage Two - Assessment

Other Evidence:

- Dialogue on test taking strategies and permissible use of a calculator.
- Explore College Board resources including Khan Academy
- Small quizzes in SAT format to include both multiple choice and open ended questions. Grid responses. Suggested to be homework as class time is limited.
- Practice SAT Test format to include both multiple choice and open ended questions. Grid responses.
- Online practice tests
- Practice scoring an SAT test
- Reflect on performance and form improvement plan

Stage Three - Instruction

Learning Plan: Suggested Learning Activities to Include Differentiated Instruction and Interdisciplinary Connections: Each learning activity listed must be accompanied by a learning goal of A= Acquiring basic knowledge and skills, M= Making meaning and/or a T= Transfer. {place A, M and/or T along with the applicable EU number in parentheses after each statement} All knowledge and skills must be addressed in this section with a corresponding lesson/activity which teaches each concept. The following color codes are used to notate activities that correspond with interdisciplinary connections and 21st Century Life & Career Connections (which involves Technology Literacy): Red = Interdisciplinary Connection; Purple = 21st Century Life & Career Connection

- Create a quadratic or exponential function or equation that models a context. (T)
- Determine the most suitable form of an expression or equation to reveal a particular trait, given a context. (A/M)
- Create equivalent expressions involving rational exponents and radicals, which includes simplifying or rewriting in other forms. (T)
- Create an equivalent form of an algebraic expression by using structure and fluency with operations. (T)
- Solve a quadratic equation having rational coefficients. The equation can be presented in a wide range of forms to reward attending to algebraic structure and can require manipulation to solve. (A,M)
- Add, subtract, and multiply polynomial expressions. Simplify the result. The expressions will have rational coefficients. (A,M)
- Solve an equation in 1 variable that contains radicals or contains the variable in the denominator of a fraction.(A)
- Solve a system of 1 linear equation and 1 quadratic equation. (A)
- Rewrite simple rational expressions. (A,M)
- Interpret parts of nonlinear expressions in terms of their context. (M,T)
- Understand the relationship between zeros and factors of polynomials. Use that knowledge to sketch graphs. (A,M)
- Understand a nonlinear relationship between 2 variables by making connections between their algebraic and graphical representations. (A,M)
- Use function notation, and interpret statements using function notation. (M,T)
- Use structure to isolate or identify a quantity of interest in an expression or isolate a quantity of interest in an equation. (M,T)
- Personalized SAT practice at Khan Academy <https://www.khanacademy.org/testprep/sat>

Pacing Guide

<i>Unit #</i>	<i>Title of Unit</i>	<i>Approximate # of teaching days</i>
1	Problem Solving and Data Analysis	12
2	Heart of Algebra	9
3	Passport to Advanced Math and Additional Topics	11

Instructional Materials

- <https://www.khanacademy.org/sat>
- <https://satsuite.collegeboard.org/sat/practice-preparation/practice-tests>
- Text: CollegeBoard's The Official SAT Study Guide

Accommodations

Special Education: The curriculum will be modified as per the Individualized Education Plan (IEP). Students will be accommodated based on specific accommodations listed in the IEP.

Students with 504 Plans: Students will be accommodated based on specific accommodations listed in the 504 Plan.

English Language Learners: Students will be accommodated based on individual need and in consultation with the ELL teacher.

Students at Risk of School Failure: Students will be accommodated based on individual need and provided various structural supports through their school.

Gifted and Talented Students: Students will be challenged to enhance their knowledge and skills through acceleration and additional independent research on the subject matter.