

Course: SAT Prep MATH Unit #: Unit 2 - Heart of Algebra	Year of Implementation: 2023-2024
Curriculum Team Members Michael Spera mspera@lrhsd.org	
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 A-SSE-A.1 Interpret expressions that represent a quantity in terms of its context. ■ NJSLS A -CED-A1-4 . Create equations that describe numbers or relationships ■ NJSLS A -REI-A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method. ■ NJSLS A -REI-B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters. ■ NJSLS A -REI-C.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. ■ NJSLS A -REI-D.10-12 Represent and solve equations and inequalities graphically ○ 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 create equations and systems of equations as well as to make connections between different representations of linear relationships.

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

the ability to analyze and create linear equations, inequalities, and functions is essential for success in college and career, as is the ability to solve linear equations and systems fluently

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?

<i>EU 2</i> Solving an equation or inequality is often only part of the problem solving process. Also required is interpreting the solution in context of the question <i>EU 3</i> there are connections between linear equations and their graphs	<i>EU 2</i> • Why is it useful to interpret solutions to algebraic problems? <i>EU 3</i> • How are linear equations and systems related to their respective graphs? • How is the graph impacted by changes made to its equation?
<u>Knowledge</u> Students will know . . . <i>EU 1</i> • linear expressions, equations and inequalities can represent a nonmathematical context. • systems of equations or inequalities can represent real world situations <i>EU 2</i> • defining variables, writing equations and interpreting solutions may all be required to solve problems	<u>Skills</u> Students will be able to. . . <i>EU 1</i> • create expressions, equations, inequalities and systems of equations/inequalities to represent a situation with and without a calculator • solve equations, inequalities, and systems of equations/inequalities and determine the number of solutions with and without a calculator • interpret accuracy of solutions <i>EU 2</i> • manipulate/rewrite equations and or formulas without a calculator • Interpret solutions in context of the problem

EU 3

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

EU 3

- 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, solve, or interpret a linear expression or equation in 1 variable. (A,M)
- Create, solve, or interpret linear inequalities in 1 variable. (A,M)
- Build a linear function that models a linear relationship between 2 quantities. (M, T)
- Create, solve, and interpret systems of linear inequalities in 2 variables. (M, T)
- Create, solve, and interpret systems of 2 linear equations in 2 variables. (M, T)
- Algebraically solve linear equations (or inequalities) in 1 variable. (A,M)
- Algebraically solve systems of 2 linear equations in 2 variables. (A,M)
- Interpret the variables and constants in expressions for linear functions. (M,T)
- Understand connections between algebraic and graphical representations. Create, solve & interpret linear equations in one variable. (M)
- Personalized SAT practice at Khan Academy <https://www.khanacademy.org/testprep/sat>

Pacing Guide

Unit #	Title of Unit	Approximate # of teaching days
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 <u>The Official SAT Study Guide</u>

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.