HILLSBOROUGH TOWNSHIP SCHOOL DISTRICT

MATHEMATICS CURRICULUM

Selected Topics

July, 2020

Course Overview
Selected Topics

The Selected Topics course is designed to provide diverse learners with a survey of mathematical topics that they are likely to encounter in college. This college preparatory level course is offered to seniors as a fourth or fifth year mathematics course. This course is structured around the New Jersey Student Learning Standards.

Topics explored include. but are not limited to, set theory, logic, number theory, equations and inequalities, graphs, functions and linear systems, consumer mathematics, geometry and measurement and probability and statistics. A real-world applications approach using a variety of tools and strategies will be incorporated into the curriculum to enhance the learning of every child.

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 1 - Problem Solving & Critical Thinking	**Time frame/Pacing:** 6 days

Essential Questions

- How can we develop mathematical models for problem solving that estimate relationships between variables?

Enduring Understandings

- Estimation techniques can be used to develop mathematical models that allow us to approximate answers to a problem.
- Complex problems can be solved using the organization of a four-step problem-solving process

Standards Taught and Assessed

- **A.CED.A.1** Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.
- **A.CED.A.2** Create equations in two or more variables to represent relationships between quantities
- **F.IF.B.4** For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.
- **A-SSE-A.1** Interpret expressions that represent a quantity in terms of its context.
- **A-SSE-B.3** Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.
- **N.Q.A.1** Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays
- **N.Q.A.2** Define appropriate quantities for the purpose of descriptive modeling.
- **N.Q.A.3** Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Highlighted Interdisciplinary Connections

- 8.1.2.DA.3: Identify and describe patterns in data visualizations.
- 8.1.2.DA.4: Make predictions based on data using charts or graphs.
- RST.11.12.2 - Determine the central ideas, themes or conclusions of a text; summarize complex concepts, processes of information presented in a text by paraphrasing them in simpler but still accurate terms.
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- 2.2.12.N.2: Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.

- 2.3.12.ATD.2: Compare and contrast the incidence and impact of commonly abused substances on individuals and communities in the United States and other countries (e.g., tobacco, e-cigarettes, vaping products, alcohol, marijuana products, inhalants, anabolic steroids, other drugs)

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.4.12.TL.3: Analyze the effectiveness of the process and quality of collaborative environments.
- 9.1.8.FP.4: Analyze how familial and cultural values influence savings rates, spending, and other financial decisions.
- 9.4.12.CI.2: Identify career pathways that highlight personal talents, skills, and abilities (e.g., 1.4.12prof.CR2b, 2.2.12.LF.8).
- 9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

Social Emotional Learning Competencies

- 2.1.12.EH.3: Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).

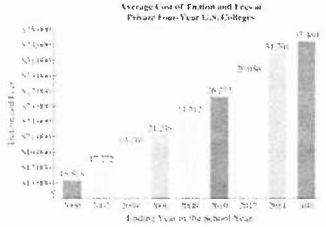
Pre-Assessment

- N.Q.A.3
- A-SSE-A.1

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Understand and use inductive and deductive reasoning.	SMP2 - Reason abstractly and quantitatively	Use inductive reasoning to identify a pattern in each list of numbers. Then use this pattern to find the next number. a. 3, 9, 15, 21, 27, _____ b. 2, 10, 50, 250, _____ c. 3, 6, 18, 72, 144, 432, _____ d. 1, 9, 17, 3, 11, 19, 5, 13, 21, _____	Textbook multimedia Quizizz practice Textbook online practice Partner Inductive /Deductive practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Use estimation techniques and graphs to answer questions and develop mathematical models.	SMP4 - Model with mathematics	The bar graph shows the average cost of tuition and fees for private four year colleges, adjusted for inflation.  a. Write a mathematical model that estimates the average cost of tuition and fees, T, for the school year ending x years after 2000. b. Use the model to project the average cost of tuition and fees for the school year ending in 2020.	Textbook multimedia Kahoot Challenge estimation Textbook online practice Small Group problem solving	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Understand and apply Polya's four step problem solving method	SMP1 - Make sense of problems and persevere in solving them.	Apply Polya's four step method to solve the following problem: A television sells for $750. Instead of paying the total amount at the time of the purchase, the same television can be bought by paying $100 down and $50 a month for 14 months. How much is saved by paying the total amount at the time of the purchase?	Textbook multimedia Textbook online practice Small Group problem solving and presentations	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Benchmark Assessment

- n/a

Summative Assessment(s)

- Unit 1 Common Assessment 1
- Unit 1 Common Assessment 2
- Unit 1 Performance Task

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 2 - Set Theory	**Time frame/Pacing:** 15 days

Essential Questions
- How can attributes be used to classify data/objects?

Enduring Understandings
- We can use Set theory to represent, organize, and interpret non-continuous data.
- We can classify data/objects by attributes to answer mathematical questions.

Standards Taught and Assessed
Extensions of:
- 8.1.8.DA.1: Organize and transform data collected using computational tools to make it usable for a specific purpose.
- 8.1.12.DA.5: Create data visualizations from large data sets to summarize, communicate, and support different interpretations of real-world phenomena.

Highlighted Interdisciplinary Connections
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- 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.
- 1.2.12prof.Cr1b: Organize and design artistic ideas for media arts productions.
- SL.11-12.5 Make strategic use of digital media (e.g., textual, graphical, audio, visual, and interactive elements) in presentations to enhance understanding of findings, reasoning, and evidence and to add interest
- 2.2.12.PF.4: Determine the role of genetics, age, nutrition, sleep, the environment, and exercise type on body composition and personal health

Highlighted Career Ready Practices and 21st Century Themes and Skill
- 9.1.12.B.1 - Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.
- 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.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specific task (e.g., W.11-12.6.).
- 9.2.12.CAP.4: Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for

achieving them, including educational/training requirements, costs, loans, and debt repayment.

Social Emotional Learning Competencies

- 2.1.12.CHSS.1: Analyze the opportunities available at home, in school, and in the community to support the mental health of oneself or an individual.
- 2.1.12.SSH.3: Analyze current social issues affecting perceptions of sexuality, culture, ethnicity, disability status and make recommendations to address those issues.

Pre-Assessment • 8.1.8.DA.1 • 8.1.12.DA.5	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formulas, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Understand basic set concepts, vocabulary and symbols	SMP7 Look for and make use of structure	Express each of the following sets using the roster method: a. Set A is the set of natural numbers less than or equal to 3. b. Set B is the set of natural numbers greater than 14. c. $O = \{x \mid x \in N \text{ and } x \text{ is odd}\}$	• Set description whole group card matching game. • Quizlet flash cards and learning activities • Textbook multimedia	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems
Understand the difference between subsets and proper subsets, and	SMP3 Construct viable arguments and critique the reasoning of others	According to the U.S. Census Bureau, the most ethnically diverse U.S.	• Visual examples of subsets and proper subsets	As per student's IEP's and 504's, for example: extra time, provide copy of

calculate the number of each for a given set		cities are New York, Los Angeles, Miami, Chicago, Washington D.C., Houston, San Diego, and Seattle. If you decide to visit some, all, or none of these cities, how many travel options do you have?	• Desmos activity • Textbook multimedia	notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems
Construct Venn diagrams and perform set operations on two and three sets	SMP2 Reason abstractly and quantitatively	Given U = {a, b, c, d, e, f}, A = {a, b, c, d}, B = {a, b, d, f}, C = {b, c, f}, Construct a Venn diagram and perform each of the following set operations: a. $A \cup (B \cap C)$ b. $(A \cup B) \cap (A \cup C)$ c. $A \cap (B \cup C')$	Set operations practiced in Quizlet Live and Quizziz.	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems
Organize information collected in surveys and answer questions about the data	SMP4 Model with mathematics	Construct a Venn Diagram and determine the cardinality for each region. Use the completed Venn diagram to answer the questions. A survey of 75 college students was taken to determine where they got the news about what's going on in the world.	Students conduct a small in class survey, representing data and answering questions.	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems

		Of those surveyed, 29 students got the news from newspapers, 43 from television, and 7 from both newspapers and television. 1) How many got the news from only newspapers? 2) How many got the news from newspapers or television?		

Benchmark Assessment • n/a	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, chunk into smaller more manageable tasks.
Summative Assessment(s) • Unit 2 Common Assessment 1 • Unit 2 Common Assessment 2 • Unit 2 Performance Task	

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 3 Logic	**Time frame/Pacing:** 20 days

Essential Questions

- How can we create a strong mathematical argument?

Enduring Understandings

- Logic is based on deductive and inductive reasoning.
- Mathematical symbols can be used to describe English sentences.
- We can use mathematics to analyze information objectively to determine an argument's validity.

Standards Taught and Assessed

- A-SSE.B.3. Choose and produce an equivalent form of an expression to reveal and explain properties of the quantity represented by the expression.

Highlighted Interdisciplinary Connections

- RL.11-12.4. Determine the meaning of words and phrases as they are used in the text, including figurative and connotative meanings; analyze the impact of specific word choices on meaning and tone
- W.11-12.1. Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence
- 6.2.12.HistoryCC.5.d: Assess the influence of television, the Internet, and other forms of electronic communication on the creation and diffusion of cultural and political information Worldwide.
- 6.3.12.CivicsPD.1: Develop plan for public accountability and transparency in government related to a particular issue(s) and share the plan with appropriate government officials.
- 8.2.2.ED.2: Collaborate to solve a simple problem, or to illustrate how to build a product using the design process
- 8.2.2.ITH.2: Explain the purpose of a product and its value.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.1.2.CAP.1: Make a list of different types of jobs and describe the skills associated with each job.
- 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.IML.8: Evaluate media sources for point of view, bias, and motivations (e.g., NJSLSA.R6, 7.1.AL.IPRET.6).
- 9.4.5.DC.4: Model safe, legal, and ethical behavior when using online or offline technology (e.g., 8.1.5.NI.2).

Social Emotional Learning Competencies

- 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
- 2.1.12.EH.2: Analyze factors that influence the emotional and social impact of mental health illness on the family.
- 2.1.12.SSH.4: Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others (defining and understanding the laws of consent and dating violence).

Pre-Assessment

- A-SSE.B.3

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Represent English statements as symbolic statements and vice versa, including quantified, compound, and negated statements.	SMP7 Look for and make use of structure	Let p, q, and r represent the following simple statements: p: The plant is fertilized. q: The plant is not watered. r: The plant wilts. Write each of the symbolic statements in words: a. $(p \wedge \sim q) \rightarrow \sim r$ b. $p \wedge (\sim q \rightarrow \sim r)$	Textbook multimedia Am I a Statement? I Have, Who Has? Game Kahoot Challenge Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Construct truth tables and use them to draw conclusions about the validity of a statement.	SMP8 Look for and express regularity in repeated reasoning.	Construct a truth table for $(p \vee q) \leftrightarrow (\sim p \rightarrow q)$ and show that the compound statement is a tautology.	Textbook multimedia Am I valid? Small Group Truth Tables Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Understand the structure of arguments and test their validity using truth tables and Euler Diagrams	SMP3 Construct viable arguments and critique the reasoning of others	Use Euler diagrams to determine whether the following argument is valid or invalid: All U.S. voters must register. All people who register must be U.S. citizens. Therefore, all U.S. voters are U.S. citizens.	Textbook multimedia Super Million Dollar Prize Entry Activity Menendez Trial Argument Analysis Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a **Summative Assessment(s)** • Unit 3 Common Assessment 1 • Unit 3 Common Assessment 2 • Unit 3 Performance Task		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 4 Number Representation & Calculation	**Timeframe/Pacing:** 12 days

Essential Questions

- How can we compare and contrast numbers?
- How can we represent numbers and perform arithmetic in other number systems?

Enduring Understandings

- There are many other positional number systems both historical and current in addition to our Hindu-Arabic number system.
- A quantity can be represented numerically in a variety of ways
- The use of one number system may be more optimal than another for use in a specific application.

Standards Taught and Assessed

[1]Extensions of:

- 8.EE A.1. Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, $32 \times 3–5 = 3–3 = 1/33 = 1/27$.
- 4.NBT-A. Use place value understanding and properties of operations to perform multi-digit arithmetic[1]
    - 4. Fluently add and subtract multi-digit whole numbers using the standard algorithm.
    - 5. Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.
    - 6. Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Highlighted Interdisciplinary Connections

- 8.1.12.DA.3: Translate between decimal numbers and binary numbers.
- 8.1.12.DA.4: Explain the relationship between binary numbers and the storage and use of data in a computing device.
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- 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.
- RST.11.12.2 - Determine the central ideas, themes or conclusions of a text; summarize complex concepts, processes of information presented in a text by paraphrasing them in simpler but still accurate terms.

Highlighted Career Ready Practices and 21st Century Themes and Skills

- CRP11 - Use technology to enhance productivity.
- CRP4 - Communicate clearly and effectively and with reason.

Social Emotional Learning Competencies

- 2.2.12.LF.4: Exhibit responsible social behavior by including and cooperating with classmates of all skill levels, assisting when needed, and collaborating respectfully to solve problems in groups, teams, and in pairs during physical activity {or mathematical activity}.

Pre-Assessment

- 8.EE A.1
- 4.NBT-A

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formulas, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Explore early number systems and how they led to the development of our Hindu Arabic number system	SMP 3 Construct viable arguments and critique the reasoning of others.	Describe one way the Babylonian system is similar to the HinduArabic system and one way that it is different. Do the same for the Mayan system.	Student groups research one early number system and present their findings to the class as well as explain how numerals are written and converted to base 10.	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions. Students uncomfortable with group presentation may submit their portion separately.
Understand the use of positional number systems and be able to convert	SMP 8 Look for and express regularity in repeated reasoning	Write the Babylonian numeral (base sixty) in Hindu-Arabic, given:	Discovery activity: Students work in groups to recall how to expand Hindu Arabic integers and	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula

other systems to and from Hindu Arabic (base 10)		TABLE 4.1 Babylonian Numerals Babylonian numerals: 𒁹 𒌋 Hindu-Arabic numerals: 1 10 1) 𒌋𒌋𒌋 𒁹𒌋𒌋 𒌋𒌋𒌋 2) 𒌋𒌋𒌋 𒌋𒌋 𒌋 𒌋	decimals. Then they explore the differences between different positional number systems. Finally they discover how to expand any numeral written in any positional number system.	sheets, reword/repeat/clarify directions and questions, challenge problems
Convert numbers in different bases up to base 16 to and from base 10.	SMP 2 Reason abstractly and quantitatively	1. Convert $E7A6_{sixteen}$ to base ten. 2. Convert the base 10 numeral 2438 to base six.	Kahoot group challenge working on expanding numerals to base 10. Small group packet work on converting other bases to base 10. Textbook multimedia	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems
Understand how to use Roman numerals and their applications	SMP 7 Look for and make sure of structure.	If a movie lists its copyright year as MXMXCVI, how many years was it made after 1950?	Card matching game of movie names with copyright years to Hindu Arabic numerals. Textbook multimedia video on Roman numerals.	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems
Perform basic arithmetic on numerals in other bases.	SMP 8 Look for and express regularity in repeated reasoning	Multiply: 45_{seven} $\times\ 3_{seven}$	Small group packet work on performing each of the 4 arithmetic operations on numbers in different bases with guiding questions:	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets,

		Divide: $3_{five}\overline{)224_{five}}$	What steps do I use for base 10 and how do I apply these steps to numbers in any other base?	reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, reword/repeat/clarify directions and questions, challenge problems		
Summative Assessment(s) • Unit 4 Common Assessment 1 • Unit 4 Common Assessment 2 • Unit 4 Performance Task				

[1]Although these standards are taken from Grade 4 and Grade 8, this application for high school mathematics is applied to number systems in bases other than base 10.

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 5 Number Theory & The Real Number System	**Time Frame/Pacing:** 14 days

Essential Questions

- How can we compare and contrast numbers?
- What makes a computational strategy both effective and efficient?

Enduring Understandings

- Numeric fluency includes both the understanding of and the ability to appropriately use numbers.
- Computational fluency includes understanding the meaning and the appropriate use of numerical operations.

Standards Taught and Assessed

- N-RN.B. Use properties of rational and irrational numbers.
- N-Q.A. Reason quantitatively and use units to solve problems.
- A-SSE.B. Write expressions in equivalent forms to solve problems

Highlighted Interdisciplinary Connections

- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context
- 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.
- RST.11.12.2 - Determine the central ideas, themes or conclusions of a text; summarize complex concepts, processes of information presented in a text by paraphrasing them in simpler but still accurate terms.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.3.ST-ET.1 - Use STEM concepts and processes to solve problems involving design and/or production.
- 9.2.12.A.1 - Analyze the relationship between various careers and personal earning goals.
- 9.3.ST-SM.4 - Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data

Social Emotional Learning Competencies

- 2.1.12.EH.4: Analyze and adapt mental and emotional health messages and communication techniques to peers and other specific target audience (e.g., dimensions of health).
- 2.1.12.PGD.1: Develop a health care plan that includes practices and strategies designed to support an active lifestyle, attend to mental

health, and foster a healthy, social and emotional life.				
Pre-Assessment • N-RN.B.		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formulas, reword/repeat/clarify directions and questions, challenge problems		
Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Solve problems using LCM and GCD	SMP 3 Construct viable arguments and critique the reasoning of others.	A relief worker needs to divide 300 bottles of water and 144 cans of food into groups that each contain the same number of items. Also, each group must have the same type of item (bottled water or canned food). What is the largest number of relief supplies that can be put in each group?	Student pairs practice finding the least common multiple (LCM) and greatest common divisors (GCD) of the prime factorizations. Think-pair-share with different problem scenarios. Is this a LCM problem or a GCD problem?	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems
Simplify expressions using order of operations for arithmetic	SMP 7 Look for and make use of structure.	Apply order of operation to simplify the following expression: $(-8)^2 - (10-13)^2(-2)$	Textbook multimedia Order of operations challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems

Express rational numbers as equivalent numbers and perform arithmetic operations on rational numbers	SMP 8 Look for and express regularity in repeated reasoning.	Perform the indicated operations. If possible, reduce the answer to its lowest terms. $(\frac{1}{2} - \frac{1}{3})^2 \div \frac{5}{8}$	Textbook multimedia Quizlet Live - team challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems
Perform computations on irrational numbers and simplify	SMP 1 Make sense of problems and persevere in solving them.	Perform the operation and simplify: $(\sqrt{3})(\sqrt{\frac{2}{3}})$	Textbook multimedia Irrational Numbers Kahoot review	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems
Identify real numbers and their properties	SMP 3 Construct viable arguments and critique the reasoning of others.	State the name of the property illustrated. 1) $6+(-4)=(-4)+6$ 2) $6+(2+7)=(6+2)+7$ 3) $2(-8+6)=-16+12$ 4) $\sqrt{17}\cdot 1=\sqrt{17}$	Real number identification whole class whiteboarding Partner activity - match expressions to properties of real numbers	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions.
Review and apply the properties of exponents to scientific notation	SMP 7 Look for and make use of structure.	In 2015, there were 680,000 police officers in the United States with yearly wages totaling $\$4.08 \times 10^{10}$. If these wages were evenly divided among all police officers, find the mean, or average, salary of a U.S. police officer. (Source: Bureau of Justice Statistics)	Zombie vs. Rules of Exponents Game Exponents Practice Packet Textbook multimedia Group problem solving with scientific notation	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems
Formulate rules and generate terms for arithmetic and	SMP 8 Look for and express regularity in repeated reasoning.	Determine if the sequence is arithmetic or geometric. Next write a general rule and find the next three	Video, practice problems, Quizlet Live practice	As per student's IEP's and 504's, for example: extra time, provide copy of

geometric sequences		terms. a) 4, 9, 14, 19 . . . b) 2, 6, 18, 54 . . .		notes, word banks/formula sheets, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word banks/formula sheets, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems		
Summative Assessment(s) • Unit 5 Common Assessment 1 • Unit 5 Common Assessment 2 • Unit 5 Performance Task				

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 6 Algebra: Equations & Inequalities	**Time Frame/Pacing:** 12 days

Essential Questions

- How can mathematics be used to provide models that help us interpret data and make predictions?

Enduring Understandings

- Algebraic representation can be used to generalize patterns, and relationships.
- Mathematical models can be used to describe and quantify physical relationships.
- The graphs of mathematical models and data help us better understand the world in which we live.

Standards Taught and Assessed

- F-LE A. Construct and compare linear and exponential models and solve problems
- F-BF A. Build a function that models a relationship between two quantities
- F-LE A.1. Distinguish between situations that can be modeled with linear functions and with exponential functions.

Highlighted Interdisciplinary Connections

- 2.2.12.N.2: Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance
- 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.
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- 2.3.12.DSDT.3: Examine the drug laws, and regulations of the State of New Jersey, other states and the affects; healthy and unhealthy on individuals, families, schools, and communities

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.1.12.PB.5: Analyze how changes in taxes, inflation, and personal circumstances can affect a personal budget.
- 9.2.12.CAP.4: Evaluate different careers and develop various plans (e.g., costs of public, private, training schools) and timetables for achieving them, including educational/training requirements, costs, loans, and debt repayment.
- 9.3.ST-SM.4 - Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.
- 9.4.12.CT.2: Explain the potential benefits of collaborating to enhance critical thinking and problem solving (e.g., 1.3E.12profCR3.a).

Social Emotional Learning Competencies

- 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.
- 2.1.12.SSH.3: Analyze current social issues affecting perceptions of sexuality, culture, ethnicity, disability status and make recommendations to address those issues.

Pre-Assessment	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
• F-LE A. • F-BF A. B • F-LE A.1	• As per student's IEP's and 504's, for example: extra time, provide copy of notes, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Simplify and evaluate algebraic expressions for use in mathematical models	SMP 7 Look for and make use of structure.	Evaluate: -5(x-7)2 + 16 when x= 4	Whole class whiteboarding game Textbook practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems
Use direct and indirect variation to solve real-word problems.	SMP 1 Make sense of problems and persevere in solving them.	Set up an equation to solve the following problem: The tax on a property with an assessed value of $65,000 is $725. Find the tax on a property with an assessed value of $100,000.	Think, pair, share problem solving Textbook practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems

Solve quadratic equations by factoring and the quadratic formula for use in mathematical models	SMP 7 Look for and make use of structure.	Solve the quadratic equations, state your method for solving and show work. a. $3x^2 - 4x = 15$ b. $x^2 - 7 = -4x$	Partner whiteboard practice factoring and solving quadratics Quadratic formula textbook practice Kahoot Quadratic Challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Use mathematical models to solve real-world problems	SMP 8 Look for and express regularity in repeated reasoning.	The percentage, p, of the United States population that was foreign-born x years after 1920 can be modeled by the formula $p = 0.004x^2 - 0.35x + 13.9$ 1) According to the model, what percentage of the U.S. population was foreign-born in 2000? 2) Does the model underestimate or overestimate the actual number displayed by the bar graph? 3) By how much?  *A substantial percentage of the United States population is foreign-born. The bar graph shows the percentage of foreign-born Americans for selected years from 1920 through 2014.* Percentage of the United States Population That Was Foreign-Born, 1920–2014 Source: U.S. Census Bureau	Small group practice modeling and problem solving. Each group presents to the class one type of problem and demonstrates their solution.	As per student's IEP's and 504's, for example: extra time, provide copy of notes, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems

Benchmark Assessment • n/a **Summative Assessment(s)** • Unit 6 Common Assessment 1 • Unit 6 Common Assessment 2 • Unit 6 Performance Task	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, chunk problems into steps, reword/repeat/clarify directions and questions, challenge problems

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 7 Algebra: Graphs, Functions & Linear Systems	**Time frame/Pacing:** 12 days

Essential Questions

- How can I generalize patterns, describe relationships, and analyze functions?

Enduring Understandings

- Mathematical situations and structures can be represented and analyzed using symbols to advance algebraic thinking.
- Mathematical models can be used to represent and understand quantitative relationships.

Standards Taught and Assessed

- A-REI.D.12 - 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.
- A-REI.C.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
- A-CED.A.2. Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.
- A-CED.A.3. 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.
- F-IF.B.6. 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.★
- F-IF.C.7. Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★

Highlighted Interdisciplinary Connections

- RST.11.12.2 - Determine the central ideas, themes or conclusions of a text; summarize complex concepts, processes of information presented in a text by paraphrasing them in simpler but still accurate terms.
- 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.
- 2.2.12.N.2: Determine the relationship of nutrition and physical activity to weight loss, gain, and maintenance.
- 6.3.12.HistoryCA.1: Analyze the impact of current governmental practices and laws affecting national security and/or First Amendment rights and privacy (e.g., immigration, refugees, seizure of personal property, juvenile detention, listening devices, deportation, religion in schools).

- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.3.ST-SM.4 - Apply critical thinking skills to review information, explain statistical analysis, and to translate, interpret and summarize research and statistical data.
- 9.4.12.O.(2).1 - Develop an understanding of how science and mathematics function to provide results, answers, and algorithms for engineering activities to solve problems and issues in the real world.
- 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

Social Emotional Learning Competencies

- 2.1.12.PGD.2: Predict how healthy and unhealthy behaviors can affect brain development and impact physical, social and emotional stages of early adulthood.
- 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.

Pre-Assessment

- A-REI.C.6

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Graph linear, quadratic and exponential equations.	SMP 2 – Reason abstractly and quantitatively	Graph on the coordinate plane: a. $5x + 2y = 4$ b. $y = 3x^2 - 12x + 1$ c. $y = 2^x + 1$	Textbook online practice Textbook Multimedia Desmos graphing activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Use graphs to understand the behavior of functions.	SMP 3 – Construct viable arguments and critique the reasoning of others.	Describe the shape of each graph. What clues in the equations help to determine the behavior of the function. a. $f(x) = 3x^2$ b. $f(x) = 3x$ c. $f(x) = 3(2^x)$	Textbook online practice Textbook Multimedia Desmos card match activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Solve modeling problems with linear, quadratic, exponential and logarithmic functions.	SMP 4 - Model with mathematics	The percentage of adult height attained by a girl who is x years old can be modeled by $f(x) = 62 - 35log(x - 4)$, where x represents the girl's age (from 5 to 15) and $f(x)$ represents the percentage of her adult height. 1. According to the model, what percentage of her adult height has a girl attained at age 13? Use a calculator with a LOG key and round to the nearest tenth of a percent.	Textbook online practice Textbook Multimedia Group problem solving and presentations	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Understand how linear programming is used in management science and use this problem solving method to maximize a quantity	SMP1 - Make sense of problems and persevere in solving them	A college student earns \$15/hr for tutoring and \$10/hr as a teacher's aide. Let x = the number of hours each week spent tutoring and y = the number of hours each week spent as a teacher's aide. Use linear programming to maximize weekly earnings. At this maximum, how many hours should be spent tutoring versus working as a teacher's aide?	Textbook multimedia Disaster scenario linear programming walkthrough Group problem solving	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Benchmark Assessment • n/a	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Summative Assessment(s) • Unit 7 Common Assessment 1 • Unit 7 Common Assessment 2 • Unit 7 Performance Task	

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 8 Personal Finance	**Time frame/Pacing:** 16 days

Essential Questions

- How can we use basic ideas about savings, loans, and investments to achieve personal financial goals ?

Enduring Understandings

- Personal finance decisions determine financial growth and future prosperity.

Standards Taught and Assessed

- F-LE.A.1 Distinguish between situations that can be modeled with linear functions and with exponential functions.
- F-BF.A.1 Write a function that describes a relationship between two quantities.★
- F-IF.B.6 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.★
- N-Q.A. Reason quantitatively and use units to solve problems

Highlighted Interdisciplinary Connections

- W.11-12.8. Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and limitations of each source in terms of the task, purpose, and audience;
- 6.1.12.EconEM.2.b: Assess the effectiveness of the new state and national governments attempts to respond to economic challenges including domestic (e.g., inflation, debt) and foreign trade policy issues.
- 6.2.12.HistoryCC.5.d: Assess the influence of television, the Internet, and other forms of electronic communication on the creation and diffusion of cultural and political information Worldwide.
- 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.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.2.12.D.3 - Justify the use of savings and investment options to meet targeted goals.
- 9.1.12.FP.2: Explain how an individual's financial values and goals may change across a lifetime and the adjustments to the personal financial plan that may be needed.
- 9.1.12.PB.2: Prioritize financial decisions by considering alternatives and possible consequences.
- 9.1.12.PB.6: Describe and calculate interest and fees that are applied to various forms of spending, debt and saving.
- 9.1.12.CDM.7: Calculate a mortgage payment based on type of loan, down payment, credit score, and loan interest rate.

- 9.1.12.CDM.8: Compare and compute interest and compound interest and develop an amortization table using business tools.
- 9.1.12.CFR.4: Demonstrate an understanding of the interrelationships among attitudes, assumptions, and patterns of behavior regarding money, saving, investing, and work across cultures.

Social Emotional Learning Competencies

- 2.1.12.EH.3: Describe strategies to appropriately respond to stressors in a variety of situations
- 2.3.12.DSDT.2: Analyze personal choices and behaviors related to substance use and misuse to determine if they align with personal values and beliefs.

Pre-Assessment

- N-Q.A
- F-IF.B.6

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Calculate percents, taxes and discounts	SMP 1 Make sense of problems and persevere in solving them	A single woman earned wages of $87,200, received $2680 in interest from a savings account, and contributed $3200 to a tax-deferred savings plan. She is entitled to a personal exemption of $4050 and a standard deduction of $6300. The interest on her home mortgage was $11,700, she paid $4300 in property taxes and $5220 in state taxes, and she contributed $15,000 to charity. a) Determine the woman's gross income. b) Determine the woman's	Textbook online practice Textbook Multimedia Small group card sort activity Joe Tax Accountant partner game	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

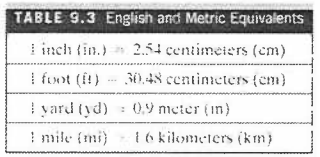
		adjusted gross income. c) Determine the woman's taxable income.		
Understand and compute simple vs. compound interest	SMP 7 Look for and make use of structure	Solve the following exercise using the appropriate compound interest formulas. Round answers to the nearest cent. 1) Suppose that you have $12,000 to invest. Which investment yields the greater return over three years: 7% compounded monthly or 6.85% compounded continuously?	Textbook online practice Textbook Multimedia Individual Kahoot challenge practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Explore and understand various methods of savings and investment	SMP 2 Reason abstractly and quantitatively.	Round to the nearest dollar. a) Suppose that between the ages of 22 and 40, you contribute $3000 per year to a 401(k) and your employer contributes $1500 per year on your behalf. The interest rate is 8.3% compounded annually. What is the value of the 401(k), rounded to the nearest dollar, after 18 years? b) Suppose that after 18 years of working for this firm, you move on to a new job. However, you keep your accumulated retirement funds in the 401(k). How much money, to the nearest dollar, will you have in the plan when you reach age 65? c) What is the difference between the amount of money you will have accumulated in the 401(k) and the amount you contributed to the plan?	Textbook online practice Textbook Multimedia Partner task cards Personal investment project	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

<table>
<tr><td>Understand and analyze processes for purchasing cars, homes, etc and using credit cards</td><td>SMP 8 Look for and express regularity in repeated reasoning.</td><td>The cost of a home is financed with a $120,000 30-year fixed-rate mortgage at 4.5%.
a) Prepare a loan amortization schedule for the first three months of the mortgage. Round entries to the nearest cent.</td><td>Textbook online practice
Textbook Multimedia Dream Car Buying activity
The Budget game</td><td>As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems</td></tr>
<tr><td colspan="2">Benchmark Assessment
• n/a</td><td colspan="3" rowspan="2">Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
• As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems</td></tr>
<tr><td colspan="2">Summative Assessment(s)
• Unit 8 Common Assessment 1
• Unit 8 Common Assessment 2
• Unit 8 Performance Task</td></tr>
</table>

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

<table>
<tr><td colspan="2">Unit Title: Unit 9 Measurement</td><td>Time frame/Pacing: 6 days</td></tr>
<tr><td colspan="3">Essential Questions
How are spatial relationships used to draw, construct, model and represent real situations or solve problems?</td></tr>
<tr><td colspan="3">Enduring Understandings
Everyday objects have a variety of attributes, each of which can be measured in many ways.
Measurements can be used to describe, compare, and make sense of phenomena</td></tr>
<tr><td colspan="3">Standards Taught and Assessed
N-Q A.Use units as a way to understand problems and to guide the solution of multi-step problems</td></tr>
<tr><td colspan="3">Highlighted Interdisciplinary Connections
8.2.12.EC.1: Analyze controversial technological issues and determine the degree to which individuals, businesses, and governments have an ethical role in decisions that are made.
6.2.12.GeoSV.1.a: Use geographic representations to assess changes in political boundaries
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.</td></tr>
<tr><td colspan="3">Highlighted Career Ready Practices and 21st Century Themes and Skill
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.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).</td></tr>
<tr><td colspan="3">Social Emotional Learning Competencies
2.1.12.SSH.4: Demonstrate strategies to prevent, manage, or resolve interpersonal conflicts without harming self or others</td></tr>
<tr><td colspan="2">Pre-Assessment
N-Q A</td><td>Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems</td></tr>
</table>

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Student Learning Objectives: We are learning to/that...	Student Strategies (Mathematical Practices)	Formative Assessment	Activities and Resources	Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
Use dimensional analysis to convert measurements between different units, including between English and metric units	SMP 7 Look for and make use of structure.	 Use **Table 9.3** (p. 587) to: a. convert 8 feet to centimeters b. convert 20 meters to yards c. convert 30 meters to inches	Textbook multimedia Partner practice and problem solving	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Measure length, and solve applied problems	SMP 2 Reason abstractly and quantitatively	There are 10 decimeters in a meter. Explain why there are not 10 cubic decimeters in a cubic meter. How many times greater is a cubic meter than a cubic decimeter?	Textbook multimedia and practice exercises Partner problem solving	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Measure area and volume, and solve applied problems	SMP 1 Make sense of problems and persevere in solving them.	A swimming pool has a volume of 22,500 cubic feet. How many gallons of water does the pool hold?	Textbook multimedia and practice exercises Partner problem solving	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Measure weight and solve applied problems.	SMP 6 Attend to precision	A man weighs 186 pounds. Convert his weight to kilograms. For each kilogram of weight, 1.2 milligrams	Textbook multimedia and practice exercises	As per student's IEP's and 504's, for example: extra time, provide copy of

		of a drug is to be given. What dosage should a 186-pound man be given?	Partner problem solving	notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		
Summative Assessment(s) • Unit 9 Common Assessment • Unit 9 Performance Task				

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 10 Geometry	**Time frame/Pacing:** 11 days

Essential Questions

- What are the mathematical attributes of objects or processes and how are they measured or calculated?
- How can we use spatial relationships, including shape and dimension, to draw, construct, model and represent real situations and solve problems?

Enduring Understandings

- Grouping by attributes (classification) can be used to answer mathematical questions.
- Geometric relationships provide a means to make sense of a variety of phenomena.

Standards Taught and Assessed

- G-SRT.A.2. 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.
- G-SRT.C.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
- G-GMD.A.3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
- G-MG A. Apply geometric concepts in modeling situations

Highlighted Interdisciplinary Connections

- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context.
- 8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources.

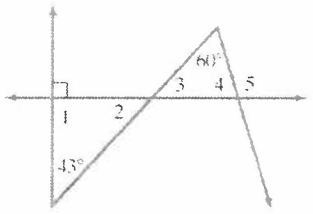
Highlighted Career Ready Practices and 21st Century Themes and Skill

- 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.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specified task (e.g., W.11-12.6.)

Social Emotional Learning Competencies

- 2.1.12.EH.1: Recognize one's personal traits, strengths, and limitations and identify how to develop skills to support a healthy lifestyle.

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Pre-Assessment • G-MG A		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		
Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Understand properties of points, lines, planes and angles.	SMP 7 Look for and make use of structure	If a transversal is perpendicular to one of two parallel lines, must it be perpendicular to the other parallel line as well? Explain.	Geometry refresh game Desmos card sort	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Use properties of triangles solve applied problems	SMP 7 Look for and make use of structure	 In the figure, suppose that the angle shown to measure 43◦ measures, instead, 36◦ . Further suppose that the angle shown to measure 60◦ measures, instead, 58◦. Under these new conditions, find the measures of angles 1 thru 5.	Textbook multimedia Small group practice packet Kahoot Challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Recognize properties of polygons, and solve	SMP 1 Make sense of problems and	A school playground is in the shape of a rectangle 400 feet long and 200 feet	Textbook multimedia Small group problem	As per student's IEP's and 504's, for example: extra

perimeter problems.	persevere to solve them	wide. If fencing costs $14 per yard, what will it cost to place fencing around the playground?	solving practice	time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Solve problems involving area and circumference, volume and surface area	SMP 8 Look for and express regularity in repeated reasoning	A circular backyard pool has a diameter of 24 feet and is 4 feet deep. One cubic foot of water has a capacity of 7.48 gallons. If water cost $2 per thousand gallons, how much, to the nearest dollar, will it cost to fill the pool? Show all work.	Textbook multimedia Small group problem solving practice Whole class Quizlet Live	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Use right triangle trigonometry to solve application problems	SMP 4 Model with Mathematics	A police helicopter is flying at 800 feet. A stolen car is sighted at an angle of depression of 72° . Find the distance of the stolen car, to the nearest foot, from a point directly below the helicopter.	Textbook multimedia Quizizz challenge practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a **Summative Assessment(s)** • Unit 10 Common Assessment 1 • Unit 10 Common Assessment 2 • Unit 10 Performance Task		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 11 Counting Methods & Probability Theory	**Time frame/Pacing:** 18 days

Essential Questions
- How can attributes be used to classify data elements?
- How can experimental and theoretical probabilities be used to make predictions and draw conclusions?

Enduring Understandings
- Grouping by attributes (classification) can be used to answer mathematical questions.
- Experimental results tend to approach theoretical probabilities after a large number of trials

Standards Taught and Assessed
- S-IC.A.2. Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation.
- S-CP.A. Understand independence and conditional probability and use them to interpret data
- S-CP.B. Use the rules of probability to compute probabilities of compound events in a uniform probability model
- S-MD.A. Calculate expected values and use them to solve problems
- S-MD.B. Use probability to evaluate outcomes of decisions

Highlighted Interdisciplinary Connections
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.
- RST.9-10.9 - Compare and contrast findings presented in a text to those from other sources, noting when findings support or contradict previous explanations or accounts.
- 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.
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context

Highlighted Career Ready Practices and 21st Century Themes and Skill
- 9.1.12.B.1 - Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.
- 9.3.12.AC.2 - Use architecture and construction skills to create and manage a project.
- 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.IML.8: Evaluate media sources for point of view, bias, and motivations (e.g., NJSLSA.R6, 7.1.AL.IPRET.6)

Social Emotional Learning Competencies

- 2.1.12.EH.4: Analyze and adapt mental and emotional health messages and communication techniques to peers and other specific target audiences (e.g., dimensions of health).
- 2.3.12.ATD.2: Compare and contrast the incidence and impact of commonly abused substances on individuals and communities in the United States and other countries (e.g., tobacco, e-cigarettes, vaping products, alcohol, marijuana products, inhalants, anabolic steroids, other drugs).

Pre-Assessment • S-MD.A	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Understand the Fundamental Counting Principle, Permutations and Combinations	SMP 4 Model with mathematics	A box contains 25 transistors, 6 of which are defective. If 6 are selected at random, find the probability that they are all defective.	Textbook multimedia Permutations worksheet Group problem solving activity Code Breakers activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Find the probability of simple and compound events.	SMP 7 Make use of structure	A letter is randomly selected from the letters of the English alphabet. Find the probability of selecting a vowel, given that the outcome is a letter that precedes K.	Textbook practice Are you better than average? dice game	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Calculate expected values and use them to solve problems	SMP 8 Look for and express regularity in repeated reasoning.	A construction company is planning to bid a building contract. The bid cost the company $3,000. The probability that the bid is accepted is ¼ . If the bid is accepted, the company will make $30,000 minus the cost of the bid. Find the expected value in this situation. Describe what this value means.	Textbook online practice Fair Game and Carnival games group activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Compute Odds and conditional probabilities	SMP 1 Make sense of problems and persevere in solving them	Use the data in the table to a) find the probability of surviving a car accident, given that the driver wore a seatbelt. b) Find the probability of wearing a seatbelt, given that the driver has survived a car accident. CAR ACCIDENTS IN FLORIDA Wore Seat Belt / No Seat Belt / Total Driver Survived / 412,368 / 162,527 / 574,895 Driver Died / 510 / 1601 / 2111 Total / 412,878 / 164,128 / 577,006	Textbook multimedia Applications of statistics article analysis on drug testing	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Benchmark Assessment

- n/a

Summative Assessment(s)

- Unit 11 Common Assessment 1
- Unit 11 Common Assessment 2
- Unit 11 Performance Task

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 12 Statistics	**Time frame/Pacing:** 16 days

Essential Questions

- How do the graphs of mathematical models and data help us better understand the world in which we live?
- How can statistics be used to make predictions or draw conclusions?

Enduring Understandings

- The message conveyed by the data depends on how the data is collected, represented and summarized.
- The results of a statistical investigation can be used to support or refute an argument.

Standards Taught and Assessed

- S.IC.A.1 - Understand statistics as a process for making inference about population parameters based on a random sample from that population
- S-IC.B.3. Recognize the purposes of and differences among sample surveys, experiments, and observational studies
- S-IC.B.4. Use data from a sample survey to estimate a population mean
- S-ID A.4. Use the mean and standard deviation of a data set to fit it to a normal distribution and to estimate population percentages.
- S-ID.B.5. Summarize categorical data for two categories in two-way frequency tables. Interpret relative frequencies in the context of the data (including joint, marginal, and conditional relative frequencies). Recognize possible associations and trends in the data.
- S-ID.C.8. Compute and interpret the correlation coefficient of a linear fit
- S-ID.C.9. Distinguish between correlation and causation.

Highlighted Interdisciplinary Connections

- RST.9-10.9 - Compare and contrast findings presented in a text to those from other sources, noting when findings support or contradict previous explanations or accounts.
- RST.11-12.4 - Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context
- 6.2.12.GeoPP.6.a: Make evidence-based inferences to determine the global impact of increased population growth, migration, and changes in urban-rural populations on natural resources and land use.
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Highlighted Career Ready Practices and 21st Century Themes and Skill

- 9.1.12.B.1 - Present resources and data in a format that effectively communicates the meaning of the data and its implications for solving problems, using multiple perspectives.

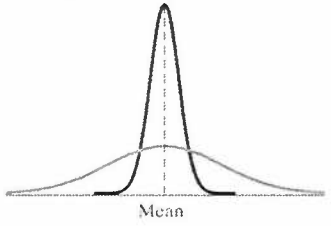
- 9.4.12.CI.1: Demonstrate the ability to reflect, analyze, and use creative skills and ideas (e.g., 1.1.12prof.CR3a).
- 9.4.12.IML.4: Assess and critique the appropriateness and impact of existing data visualizations for an intended audience (e.g., S-ID.B.6b, HS-LS2-4).
- 9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specific task (e.g., W.11-12.6.).

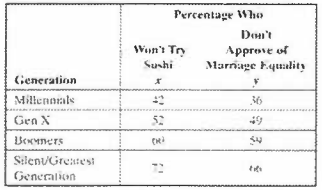
Social Emotional Learning Competencies

- 2.1.12.PGD.2: Predict how healthy and unhealthy behaviors can affect brain development and impact physical, social and emotional stages of early adulthood.
- 2.1.12.SSH.1: Analyze the influences of peers, family, media, social norms and culture on the expression of gender, sexual orientation, and identity.

Pre-Assessment	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
• S.IC.A.1	• As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Understand Sampling, Frequency Distributions, and Graphs	SMP 2 Reason abstractly and quantitatively.	1) The government of a large city needs to determine whether the city's residents will support the construction of a new jail. The government decides to conduct a survey of a sample of the city's residents. Which one of the following procedures would be most appropriate for obtaining a sample of the city's residents? a. Survey a random sample of the employees and inmates at the old jail. b. Survey every fifth person who walks into City Hall on a given day. c. Survey a random sample of persons within each geographic region of the city. d. Survey the first 200 people listed in the city's telephone directory.	Textbook multimedia Quizizz scenario activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

Calculate measures of central tendency and understand the meaning of each	SMP 3 Construct viable arguments and critique the reasoning of others.	Use the data in the table to find the mean percentage of adults from the 10 countries who agree that inventiveness is an inherited trait:  	Textbook multimedia Textbook practice problems Quizlet partner challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Calculate measures of dispersion and understand the meaning of each	SMP 7 Look for and make use of structure.	Find the mean and standard deviation for the following data: 2, 4, 7, 11, 14, 18	Textbook multimedia Textbook practice problems Kahoot challenge	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Understand characteristics of and solve problems using the normal distribution	SMP 1 Make sense of problems and persevere in solving them.	Compare the similarities and differences of the two normal distributions shown in the figure.  	Textbook multimedia Texbook practice problems Group problem solving activity	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems

<table>
<tr>
<td>Understand and explore scatterplots, correlation and regression</td>
<td>SMP 8 Look for and express regularity in repeated reasoning.</td>
<td>Determine the correlation coefficients between the percentages of people who won't try sushi and who don't approve of marriage equality:
 
<table>
<tr><th rowspan="2">Generation</th><th colspan="2">Percentage Who</th></tr>
<tr><th>Won't Try Sushi</th><th>Don't Approve of Marriage Equality</th></tr>
<tr><td>Millennials</td><td>42</td><td>36</td></tr>
<tr><td>Gen X</td><td>52</td><td>49</td></tr>
<tr><td>Boomers</td><td>60</td><td>59</td></tr>
<tr><td>Silent/Greatest Generation</td><td>72</td><td>66</td></tr>
</table></td>
<td>Textbook
Multimedia
Scatterplot graphing
Desmos regression activity</td>
<td>As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems</td>
</tr>
<tr>
<td colspan="2">Benchmark Assessment
• n/a

Summative Assessment(s)
• Unit 12 Common Assessment 1
• Unit 12 Common Assessment 2
• Unit 12 Performance Task</td>
<td colspan="3">Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)
• As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems</td>
</tr>
</table>

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 13 Voting & Apportionment	**Time frame/Pacing:** 10 days

Essential Questions
- How can experimental and theoretical probabilities be used to make predictions and draw conclusions?

Enduring Understandings
- The message conveyed by the data depends on how the data is collected, represented and summarized.
- The results of a statistical investigation can be used to support or refute an argument.

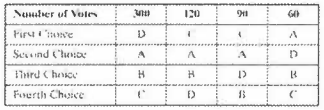
Standards Taught and Assessed
- S-IC.A.1 - Understand statistics as a process for making inference about population parameters based on a random sample from that population.
- S.IC.A.2 - Decide if a specified model is consistent with results from a given data generating process.

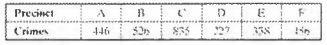
Highlighted Interdisciplinary Connections
- RST.9-10.9 - Compare and contrast findings presented in a text to those from other sources, noting when findings support of contradict previous explanations or accounts.
- 6.1.12.CivicsPI.14.a: Draw from multiple perspectives to evaluate the effectiveness and fairness of the processes by which local, state, and national officials are elected.
- 6.1.12.GeoPP.14.a: Use data and other evidence to determine the impact of recent immigration and migration patterns in New Jersey and the United States on demographic, social, economic, and political issues.
- 8.1.5.DA.5: Propose cause and effect relationships, predict outcomes, or communicate ideas using data.

Highlighted Career Ready Practices and 21st Century Themes and Skill
- 9.1.4.A.5: Apply critical thinking and problem solving skills in classroom and family settings.
- 9.4.12.TL.1: Assess digital tools based on features such as accessibility options, capacities, and utility for accomplishing a specific task (e.g., W.11-12.6.).
- 9.4.12.CT.1: Identify problem-solving strategies used in the development of an innovative product or practice (e.g., 1.1.12acc.C1b, 2.2.12.PF.3).

Social Emotional Learning Competencies
- 2.1.12.EH.3: Describe strategies to appropriately respond to stressors in a variety of situations (e.g., academics, relationships, shootings, death, car accidents, illness).

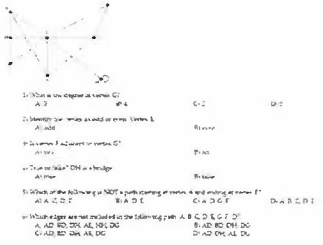
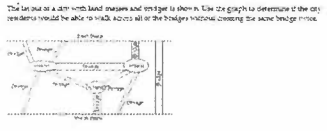
- 2.1.12.SSH.3: Analyze current social issues affecting perceptions of sexuality, culture, ethnicity, disability status and make recommendations to address those issues.

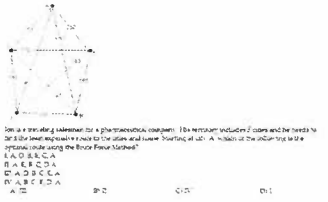
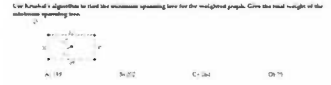
Pre-Assessment • S-IC.A.1 • S.IC.A.2		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		
Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Explore and analyze various voting methods and their flaws	SMP 3 Construct viable arguments and critique the reasoning of others.	1) Voters in a small town are considering four proposals, A, B, C, and D, for the design of affordable housing. The winning design is to be determined by the Borda count method. The preference table for the election is shown.  a. Which design has a majority of first-place votes? b. Using the Borda count method, which design will be used for the affordable housing? c. Is the majority criterion satisfied? Explain your answer.	Textbook multimedia Small group research and analysis of voting methods Find the Flaw activity Online textbook practice problems	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems
Explore and analyze various apportionment methods and their flaws	SMP 7 Look for and make use of structure	The police department in a large city has 180 new officers to be apportioned among six high-crime precincts. Crimes by precinct are shown in the following table. Use	Textbook multimedia Small group research and	As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula

		Adams's method with d = 16 to apportion the new officers among the precincts.  	analysis of apportionment methods Kahoot challenge Online textbook practice problems	sheet, reword/repeat/clarify directions and questions, challenge problems
Benchmark Assessment • n/a **Summative Assessment(s)** • Unit 13 Common Assessment 1 • Unit 13 Common Assessment 2 • Unit 13 Performance Task		**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)** • As per student's IEP's and 504's, for example: extra time, provide copy of notes, word bank / formula sheet, reword/repeat/clarify directions and questions, challenge problems		

Hillsborough Township Public Schools
Selected Topics Mathematics Curriculum

Unit Title: Unit 14 Graph Theory	**Time frame/Pacing:** 12 days
Essential Questions • How can graph theory be used to solve real world efficiency problems?	
Enduring Understandings • Graphs can be used to model relationships of physical settings using trees, paths, and circuits.	
Standards Taught and Assessed • F-IF.C.7 Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.★	
Highlighted Interdisciplinary Connections • 8.2.8.ED.3: Develop a proposal for a solution to a real-world problem that includes a model (e.g., physical prototype, graphical/technical sketch) • 8.1.12.IC.3: Predict the potential impacts and implications of emerging technologies on larger social, economic, and political structures, using evidence from credible sources. • RST.11-12.7 - Integrate and evaluate multiple sources of information presented in diverse formats and media to address a question or solve a problem.	
Highlighted Career Ready Practices and 21st Century Themes and 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.IML.3: Analyze data using tools and models to make valid and reliable claims, or to determine optimal design solutions (e.g., S-ID.B.6a., 8.1.12.DA.5, 7.1.IH.IPRET.8) • 9.3.ST-ET.1 - Use STEM concepts and processes to solve problems involving design and/or production. • 9.3.ST-ET.4 - Apply the elements of the design process.	
Social Emotional Learning Competencies • 2.3.8.ATD.1: Examine how the use of alcohol, tobacco, and other drugs by adolescents has impacted their lives and the lives of family members socially, emotionally, and physically. • 2.1.12.SSH.5: Demonstrate ways to show respect for the boundaries of others	
Pre-Assessment • F-IF.C.7	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**

		• As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions,		
Student Learning Objectives: We are learning to/that...	**Student Strategies (Mathematical Practices)**	**Formative Assessment**	**Activities and Resources**	**Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)**
Understand and use the vocabulary of graph theory	SMP 3 Construct viable arguments and critique the reasoning of others	Recognize in a graph the vertices, degrees, paths, circuits and bridges. 	Textbook multimedia Vocabulary card sort I Have, Who Has? Game Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems
Understand and use Euler's Theorem to solve problems	SMP 1 Make sense of problems and persevere in solving them	Use Euler's Theorem to determine the existence of Euler paths and circuits in a given graph. 	Textbook multimedia Partner problem solving QuizizzPractice Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems
Understand and use Hamilton paths and circuits to find optimal solutions to problems	SMP 8 Look for and express regularity in repeated reasoning	Find an optimal Hamilton circuit for the traveling salesperson problem using the Brute force or Nearest Neighbor method.	Textbook multimedia Think Pair, Share Optimal strategy Small groups design circuits for other groups Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems

				
Understand and use tree graphs, including solving problems with Kruskal's Algorithm for trees.	SMP 7 Look for and make use of structure	Find the minimum spanning tree for a given weighted graph. 	Textbook multimedia Tree Design Small group Problem solving Textbook online practice	As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems

Benchmark Assessment

- n/a

Summative Assessment(s)

- Unit 14 Performance Task

Modifications/Accommodations (ELL, Special Education, Gifted, At-Risk of Failure, 504)

- As per student's IEP's and 504's, for example: extra time, provide copy of notes, reword/repeat/clarify directions and questions, challenge problems, chunk into smaller more manageable tasks

Bibliography
Selected Topics

Digital Recommended Resources:

Blitzer, Robert. (2015). *Thinking Mathematically*. Upper Saddle River, New Jersey: Pearson Education, Inc.

www.mymathlab.com