



Township of Ocean Schools

Assistant Superintendent
Office of Teaching and Learning

SPARTAN MISSION:

Meeting the needs of all students with a proud tradition of academic excellence.

Curriculum Development Timeline

School: Ocean Township High School

Course: Algebra I Math Test Prep

Department: Mathematics

Board Approval	Supervisor	Notes
August 2018	Nichole Kerney	Born Date

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Week	Marking Period 1
1	Rational vs. Irrational Numbers, Online Tools
2	Linear Equations, Inequalities, and Systems of Linear Equations
3	Functions
4	Quadratics and Polynomial Functions
5	Quadratics and Polynomial Functions
Week	Marking Period 2
6	Algebra 1 PARCC Practice
7	Algebra 1 PARCC Practice
8	Real-World Applications and Modeling
9	Real-World Applications and Modeling
10	Real-World Applications and Modeling

Time Frame	1 week (5 blocks)
Topic	
Unit 1: Rational vs. Irrational Numbers, Online Tools	
Essential Questions	
What are the sets of Real, Rational, and Irrational numbers? How can you determine if a number is rational or irrational? What are the characteristics of a rational number? What are the characteristics of an irrational number?	

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Enduring Understandings

Rational numbers can be represented in multiple ways.
All real numbers, which include rational and irrational numbers, can be plotted on a number line.
An irrational number cannot be represented as a simple fraction.
Irrational numbers are those real numbers that cannot be represented as terminating or repeating decimals.

Alignment to Standards

N.Q.1, N.RN.3, A.SSE.1, A.CED.2, F.IF.4, CPR4

Key Concepts and Skills

Arithmetic Skills and Concepts
Rational vs Irrational/operations
Like terms
Word problem
Utilize graphing calculator
Use of formulas from PARCC Reference sheet
Get familiar with given PARCC online tools
Familiarize students with point emphasis of the test and types of questions they will be asked
Compare fractions, square roots, pi etc.
Use TI 84 to determine frac to decimal, use sq rt key to find decimal approximation of irrational roots

Learning Activities

TI 84 practice exercises on keys representative of the tasks for the PARCC
Matching games online or Smart Board activities - (drag number to correct category)
File Cards "Find my Match" group activity
Number cards group activity sorting by different methods of choice [Are you Rational or Irrational? - mdk12](#)
Human Number Line
Communicators/white boards
Videos

Assessments

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Quiz aligned to PARCC Formative: anticipatory set/exit ticket							
21st Century Skills							
Creativity		Critical Thinking		Collaboration	x	Communication	x
Life & Career Skills	x	Information Technology	x	Media Literacy	x		
Interdisciplinary Connections							
Historical data in tables and graphs Science: Converting Celsius/Kelvin							
Technology Integration							
8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Graphing calculator							

Time Frame	1 week (5 blocks)
Topic	
Unit 2: Linear Equations, Inequalities, and Systems of Linear Equations	
Essential Questions	
<p>How do you solve multi-step equations and inequalities? How can you determine the solution of an equation or inequality (no solution, infinite solutions, one solution)? How do you transform a literal equation? What kinds of equations can you model for a real-life application? How do you solve a problem using a problem solving plan? How is solving an absolute value inequality different from an equation?</p>	

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What kind of application problem can be solved using a system?
How do you determine the number of solutions of a system?

Enduring Understandings

When solving an equation you may not always get one answer.
There is more than one way to solve a proportion, some methods are more effective than others.
An inequality results in an infinite amount of answers with an ending or beginning value.
Absolute value equations result in an infinite amount of points between two values or outside of two values.
Absolute value inequalities result in an infinite amount of points between two values or outside of two values.

Alignment to Standards

N.Q.2, N.Q.3, F.IF.2, F.IF.4, F.IF.5, F.IF.6, F.IF.7a, F.IF.9, F.BF.1a, F.BF.3, F.LE.2, F.LE.5, S.ID.7, A.CED.2, A.CED.3, A.REI.5, A.REI.6, A.REI.10, A.REI.11, A.REI.12, CPR6, CPR11

Key Concepts and Skills

System of Equations
Linear equations
Rearrange formulas
Inequalities
Students should be able to solve an equation in one variable with single or multi steps.
When solving an inequality, you are finding the endpoint and then shading in a specific direction.
When solving an absolute value, you are getting 2 answers most of the time.
Mixture problem (such as weighted averages), uniform motion problem (such as opposite direction, same direction, and back and forth)
Percent of change
Graph an inequality on a number line
Solve an absolute value equation

Learning Activities

Desmos activities
Scavenger Hunts
Word Problems
videos

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Assessments							
Quiz/Test aligned to PARCC Formative: anticipatory set/exit ticket							
21st Century Skills							
Creativity		Critical Thinking		Collaboration	x	Communication	
Life & Career Skills	x	Information Technology		Media Literacy	x		
Interdisciplinary Connections							
Historical data in tables and graphs Business and Finance: comparing companies							
Technology Integration							
8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Graphing calculator							

Time Frame	1 week (5 blocks)
Topic	
Unit 3: Functions	
Essential Questions	
How do you determine if a function is linear, exponential, or quadratic? What is the domain and range of a function? Independent/Dependent variables? How do you interpret a graph given a situation? What is a function compared to a relation?	

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What are the different ways to represent a function?
Can you write a rule from a table?

Enduring Understandings

All functions are relations, but all relations are not functions.
Function patterns can be represented in two variables.
Functional relationship relates the value of one variable, such as y or $f(x)$, to another variable, such as x .
Functional relationships can be related visually by graphs, as well as by sets, rules, tables, and mappings.

Alignment to Standards

N.Q.1, N.Q.2, A.CED.2, A.CED.3, A.REI.10, F.IF.1, F.IF.2, F.IF.4, F.IF.5, F.IF.7a, F.IF.9,
F.LE.2, CPR4, CPR8

Key Concepts and Skills

To interpret, sketch and analyze graphs from various situations (ie time vs distance from home)
To identify relations and functions
To evaluate functions
To determine range and domain
To utilize function notation, $f(x)$, evaluate and construct tables
To use the vertical line test to determine if a relation is a function
To write function rules based on real world situations
Compare the types of functions from equations & graphs - linear, quadratic, exponential
Interpret graphs over intervals. ie warming vs cooling graphs.
Compare $f(x)$ to $g(x)$ as graphs ie from graph determine $f(1)$, $g(3)$, $f(g(2))$.

Learning Activities

<https://www.illustrativemathematics.org/content-standards/tasks/637>
<https://www.illustrativemathematics.org/content-standards/tasks/639>
<https://www.illustrativemathematics.org/content-standards/tasks/649>
<https://www.illustrativemathematics.org/>

Videos

TI 84 tables created from functions

Desmos activities - ie

“Function Carnival “ <https://teacher.desmos.com/carnival> or

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<p>“Function or Not” https://teacher.desmos.com/activitybuilder/custom/5799460e787fac8877c58958 https://betterlesson.com/lesson/resource/3119386/function-card-sort-pdf</p>						
Assessments						
<p>Quiz/Test aligned to PARCC Formative: anticipatory set/exit ticket</p>						
21st Century Skills						
Creativity		Critical Thinking	x	Collaboration	x	Communication
Life & Career Skills		Information Technology	x	Media Literacy	x	
Interdisciplinary Connections						
<p>Science and history: graphs and functions Writing functions of real world events - ie miles per gallon, calories per hour</p>						
Technology Integration						
<p>8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge. Graphing calculator</p>						

Time Frame	2 weeks (10 blocks)
Topic	
Unit 4: Quadratics and Polynomial Functions	
Essential Questions	

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How do you graph a quadratic function using key features?
How do you determine max or min values? Vertex ?
How do you solve a quadratic?
How do you determine zeros of a cubic function ?
What does the discriminant tell you about the solutions of a quadratic function?

Enduring Understandings

Students will be able to distinguish second degree equations (quadratic) from first degree (linear).
Students will be able to compare and identify applications of linear, quadratic or exponential functions as models of real world situations.
The quadratic formula is most appropriately used when factoring a quadratic equation is not possible.

Alignment to Standards

A.APR.3, A.CED.1, A.CED.2, A.CED.3, A.REI.4, A.REI.10, A.SSE.3a, A.SSE.3b, F.IF.2, F.IF.4, F.IF.5, F.IF.7a, F.IF.7c, F.IF.8a, F.IF.9, F.BF.3, CPR6, CPR8, CPR11

Key Concepts and Skills

Quadratics
Factoring quadratics
Zeros of polynomials/cubics given one factor
To plot standard form of quadratic functions from a table.
Compare basic transformations of parent function.
Identify the vertex.
Explore real world problem solving involving quadratic functions. (ie projectile motion max height, crash point)
Determine zeros of a quadratic function by factoring, graphing and quadratic formula.

Learning Activities

TI 84 – compare transformations of parent function, compare linear, quadratic, exponential
Activity lab p 650 max and min TI 84
Internet project on power point to determine applications of parabolas.
Excel /TI 83 activity to find linear, quadratic, exponential regression trend line.

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Videos

Communicators

Desmos activities <https://teacher.desmos.com/quadratic>

Videos -Steph Curry <https://www.youtube.com/watch?v=HOiH1eVCggw>

Modeling Quadratics:

<https://docs.google.com/document/d/1BJHMg0sU6bCTh2J7yJCo9Ah7VemsNnc5NcseRYEdbZo/edit>

Assessments

Quiz/Test aligned to PARCC

Project: projectile motion

Formative: anticipatory set/exit ticket

21st Century Skills

Creativity	x	Critical Thinking		Collaboration	x	Communication	
Life & Career Skills	x	Information Technology	x	Media Literacy	x		

Interdisciplinary Connections

Physics: Many formulas in physics are quadratic equations, such as projectile motion

Technology Integration

8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Graphing calculator, Excel activities

Time Frame

2 weeks (10 blocks)

Topic

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Unit 5: Algebra 1 PARCC Practice

Essential Questions

What is the PARCC format and questions and tools and formula sheet?
How do you determine if a number is rational or irrational or not real?
How do you perform operations with polynomials - add subtract multiply factor?
How do you solve a system of equations?
What are the ways to identify values of functions on a graph $f(x)$ or $g(x)$?
How do you graph linear functions and inequalities?
What are the elements of writing equations for functions representing cost and time?
What are the keys to interpreting tables and graphs?
What are the main methods to rearrange and solve formulas for different variables?
What are the different ways to solve quadratic equations?
How do you determine the function that would fit a given table of values?

Enduring Understandings

There are several ways to solve a quadratic equation.
There are several ways to solve a system of equations
There are distinct differences between linear, quadratic and exponential graphs and equations
Solving for a given variable in an equation involves a sequence of steps.
Real life situations can be interpreted in a mathematical language of functions.
Functions relate an independent and dependent variable in different ways and form equations and graphs.

Alignment to Standards

N.RN.3, N.Q.1-3, A.SSE.1-3, A.APR.1, A.APR.3, A.CED.1-4, A.REI.1, A.REI.3-6, A.REI.10-12, F.IF.1-9, F.BF.1, F.BF.3, F.LE.1-5, S.ID.1-3, S.ID.5-9, CRP8, CRP11

Key Concepts and Skills

Become familiar with the PARCC test format and tools.
Gain understanding of the mathematical language of functions, numbers, graphs, and equations.
Gain understanding of the applications of algebra to real world situations.
Compare sets of numbers.
Write formulas or equations as functions to describe a real world situation.

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Learning Activities

<https://parcc.pearson.com/practice-tests/math/>
www.nj.gov/education/archive/sca/ppt/gears/turn-key-parcc.pptx
https://parcc-assessment.org/content/uploads/released_materials/02/2016_Math_Released_Items_Scorer_Training.pdf
<https://drive.google.com/file/d/0BzrAYYk-aDO2d0dTWHd6RXZHnM/view>

Assessments

Practice assessments questions modeled on PARCC
 Quiz/Test aligned to PARCC
 Project: write your own parcc questions, score student responses
 Formative: anticipatory set/exit ticket

21st Century Skills

Creativity		Critical Thinking	x	Collaboration		Communication	x
Life & Career Skills		Information Technology	x	Media Literacy	x		

Interdisciplinary Connections

Variety of questions modeled on PARCC problems real world questions
 Science: mixture problems, scientific notation, solving equations in real-world
 Rates of change in science, history, and business
 History/Biology: trends in growth and decay

Technology Integration

8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.
 Graphing calculator, Google forms practice , online quizzes

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Time Frame	3 weeks (15 blocks)
Topic	
Unit 6: Real-World Applications and Modeling	
Essential Questions	
How can mathematical functions describe real world problems? What are some careers that use algebraic functions and how do they apply this knowledge? What are some of the historical discoveries in mathematics over timeline and who were some of the great mathematicians that made these discoveries? What are some topics in mathematics that will build on algebra 1?	
Enduring Understandings	
The world can be described in the mathematical terms of functions and equations and graphs. We use variables to represent unknown quantities and we can construct equations or functions to represent these quantities and solve for some and make predictions for others.	
Alignment to Standards	
N.RN.3, N.Q.1-3, A.SSE.1-3, A.APR.1, A.APR.3, A.CED.1-4, A.REI.1, A.REI.3-6, A.REI.10-12, F.IF.1-9, F.BF.1, F.BF.3, F.LE.1-5, S.ID.1-3, S.ID.5-9, CRP8, CRP11	
Key Concepts and Skills	
Gain understanding of the mathematical language of functions, numbers, graphs, and equations Gain understanding of the applications of algebra to real world situations. Write formulas or equations as functions to describe a real world situation. Gain experience in making a presentation and communicating in class in mathematical language.	
Learning Activities	
Various math projects to be selected: .History of mathematics (discoveries or mathematicians) Presentation on future topics in math (i.e. geometry, trigonometry.) Teach a lesson with required plans, quiz, presentation, handouts. Create posters on various algebra topics as instructive tools for others. Create powerpoint or video as instructive on algebra topics.	

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Students can select from a bank of projects to do a presentation
<https://www.weareteachers.com/5-awesome-end-of-year-projects-to-keep-your-math-students-engaged/> (some possible projects)
<http://www.theveritasacademy.com/summer-projects-2015-9th-10th-and-11th-grade-assignments/> (a project for algebra 1)

Assessments

Benchmark Project based research and presentation assessed by a rubric.
Experiments and math/ scientific descriptions.

21st Century Skills

Creativity	x	Critical Thinking	x	Collaboration	x	Communication	x
Life & Career Skills	x	Information Technology	x	Media Literacy	x		

Interdisciplinary Connections

Science: Real world connections through experimentation and statistics.
Physics and algebra in the real world in architecture, astronomy, projectile motion, art.

Technology Integration

8.1 Educational Technology- All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaboratively and to create and communicate knowledge.

Modifications (ELL, Special Education, Gifted and Talented, and 504 Plans)

ELL:

- Work toward longer passages as skills in English increase
- Use visuals
- Introduce key vocabulary before lesson
- Teacher models reading aloud daily
- Provide peer tutoring

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- Use of Bilingual Dictionary
- Guided notes and/or scaffold outline for written assignments
- Provide students with English Learner leveled readers.

Supports for Students With IEPs:

- Allow extra time to complete assignments or tests
- Guided notes and/or scaffold outline for written assignments
- Work in a small group
- Allow answers to be given orally or dictated
- Use large print books, Braille, or books on CD (digital text)
- Follow all IEP modifications

Gifted and Talented:

- Create an enhanced set of introductory activities (e.g. advance organizers, concept maps, concept puzzles)
- Provide options, alternatives and choices to differentiate and broaden the curriculum
- Organize and offer flexible small group learning activities
- Provide whole group enrichment explorations
- Teach cognitive and methodological skills
- Use center, stations, or contracts
- Organize integrated problem-solving simulations
- Propose interest-based extension activities
- Expose students to beyond level texts.

Supports for Students With 504 Plans:

- Follow all the 504 plan modifications
- Text to speech/audio recorded selections
- Amplification system as needed
- Leveled texts according to ability
- Fine motor skill stations embedded in rotation as needed
- Modified or constrained spelling word lists
- Provide anchor charts with high frequency words and phonemic patterns

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