

**WEYMOUTH TOWNSHIP MATHEMATICS
CURRICULUM**

Content Area: Mathematics

Course Title: Middle School

Grade Level: Algebra

**Unit 1 Plan:
Number and Quantity**

**September-November
Ongoing**

**Unit 2 Plan:
Algebra**

**November-January
Ongoing**

**Unit 3 Plan:
Functions**

**February-April
Ongoing**

**Unit 4 Plan:
Probability and Statistics**

**April-June
Ongoing**

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July 2022

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August 2023

Algebra I Curriculum Weymouth Township School

Gr –Algebra Subject MATH Unit Plan 1 : Number and Quantity (The Real Number System, Quantities)

Unit Overview

Content topic and skill focus: Number and Quantity (The Real Number System, Quantities)

New Jersey Student Learning Standards

Standard, Strand, and Content statements (CPIs listed below)

Learning in this unit will focus on: **Number and Quantity (The Real Number System, Quantities)**

Standard MA.N-RN.A.1, MA.N-RN.A.2, MA.N-RN.B.3, MA.N-Q.A.1, MA.N-Q.A.2, MA.N-Q.A.3

Content Statement: Quantities. In real world problems, the answers are usually not numbers but quantities: numbers with units, which involves measurement. In their work in measurement up through Grade 8, students primarily measure commonly used attributes such as length, area, and volume. In high school, students encounter a wider variety of units in modeling, e.g., acceleration, currency conversions, derived quantities such as person-hours and heating degree days, social science rates such as per-capita income, and rates in everyday life such as points scored per game or batting averages. They also encounter novel situations in which they themselves must conceive the attributes of interest.

Instructional Focus Numbers and Quantities (The Real Number System, Quantities)

Lesson #: Sections 1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7, 2.1, 2.3, 2.6, 3.2, 3.3, 3.4, 4.1, 4.5, 6.1, 6.2, 6.3, 6.4, 7.2, 7.3, 8.1, 8.6, 9.1, 9.3, 9.4, 10.3, 10.4, 11.2, 11.3, 11.5

Essential Questions:

- How can you multiply and divide square roots?
- How can you use inductive reasoning to observe patterns and write general rules involving properties of exponents?
- How can you write and evaluate an n th root of a number?
- What are the characteristics of an exponential function?
- How can you use inductive reasoning to discover rules in mathematics? How can you test a rule?
- How can you use a formula for one measurement to write a formula for a different measurement?
- How can you recognize a linear equation? How can you draw its graph?
- How can you sketch the graph of a system of linear inequalities?

Student Learning Objectives: STUDENTS WILL BE ABLE TO:

- **Domain: The real number system**
- MA.N-RN.A.1 Explain how the definition of the meaning of rational exponents follows from extending the properties of integer exponents to those values, allowing for a notation for radicals in terms of rational exponents.
- Section 6.2 Students will be able to solve problems with Radicals and Rational Exponents
- MA.N-RN.A.2 Rewrite expressions involving radicals and rational exponents using the properties of exponents.
- Section 6.1 Students will be able to solve problems using Properties of Exponents
- Section 6.2 Students will be able to solve problems with Radicals and Rational Exponents
- Section 6.3 Students will be able to solve problems using Exponential Functions
- Section 6.4 Students will be able to solve problems using exponential decay
- Section 7.2 Students will be able to multiply and divide polynomials

- Section 7.3 Students will be able to solve problems using special products of polynomials
- Section 9.1 Students will be able to solve problems using properties of radicals
- Section 9.3 Students will be able to solve quadratic equations using square roots
- Section 10.3 Students will be able to solve radical equations
- Section 10.4 Students will be able to solve problems using inverse of a function
- MA N-RN.B.3 Explain why the sum or product of two rational numbers is rational; that the sum of a rational number and an irrational number is irrational; and that the product of a nonzero rational number and an irrational number is irrational.
- Section 9.1 Students will be able to solve problems using properties of radicals.
- **Domain: Quantities**
- MA.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. Found throughout. For example:
 - Section 1.1 Students will be able to solve simple equations
 - Section 1.2 Students will be able to solve multi-step equations
 - Section 1.3 Students will be able to model quantities
 - Section 1.4 Students will be able to measure with accuracy
 - Section 1.5 Students will be able to solve equations with variables on both sides
 - Section 1.6 Students will be able to solve absolute value equations
 - Section 1.7 Students will be able to rewrite equations with formulas
 - Section 2.1 Students will be able to write and graph inequalities
 - Section 2.3 Students will be able to solve inequalities using multiplication or division
 - Section 2.6 Students will be able to solve absolute value inequalities
 - Section 3.2 Students will be able to solve problems with characteristics of functions
 - Section 3.3 Students will be able to solve linear functions
 - Section 3.4 Students will be able to solve problems using function notation
 - Section 4.1 Students will be able to solve problems using slope-intercept form
 - Section 4.5 Students will be able to analyze lines of fit
 - Section 8.1 Students will be able to graph $f(x)=ax^2$
 - Section 9.4 Students will be able to solve quadratic equations by completing the square
 - Section 11.2 Students will be able to solve problems using box-and-whisker plots
 - Section 11.3 Students will be able to solve problems using shapes of distributions
 - Section 11.5 Students will be able to solve problems choosing a data display
- MA.N-Q.A.2 Define appropriate quantities for the purpose of descriptive modeling. Found throughout. For example:
 - Section 1.3 Students will be able to model quantities
 - Section 7.1 Students will be able to add and subtract polynomials
 - Section 7.2 Students will be able to multiply and divide polynomials
 - Section 7.3 Students will be able to solve problems using special products of polynomials
 - Section 7.7 Students will be able to solve problems by factoring special products
 - Section 7.8 Students will be able to solve problems by factoring polynomials completely
 - Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
 - MA.N-Q.A.3 Choose a level of accuracy appropriate to limitations on measurement when reporting quantities. Found throughout. For example:
 - Section 1.2 Students will be able to solve multi-step equations
 - Section 1.4 Students will be able to measure with accuracy
 - Section 1.7 Students will be able to rewrite equations with formulas
 - Section 2.3 Students will be able to solve inequalities using multiplication or division
 - Section 4.5 Students will be able to analyze lines of fit
 - Section 6.2 Students will be able to solve problems using radicals and rational exponents
 - Section 6.4 Students will be able to solve problems using exponential growth and decay
 - Section 8.3 Students will be able to solve problems by graphing $f(x)=ax^2 +bx+c$

<ul style="list-style-type: none"> ● Section 8.6 Students will be able to compare linear, exponential, and quadratic functions ● Section 9.1 Students will be able to solve problems using properties of radicals ● Section 9.2 Students will be able to solve quadratic equations by graphing ● Section 9.3 Students will be able to solve quadratic equations using square roots ● Section 9.5 Students will be able to solve quadratic equations using the quadratic formula 	
<p>Suggested Activities</p> <ul style="list-style-type: none"> ● Introduction videos ● ixl ● graphic organizers ● scavenger hunts ● flash cards ● My Dear Aunt Sally Game ● online questions correlated to textbook ● online textbook lesson ● Stem Videos 	<p>Instructional Materials/Resources</p> <ul style="list-style-type: none"> ● Big Ideas Math Textbook copyright 2022 ● Big Ideas record and practice journal ● Big Ideas resource by chapter workbook ● Big Ideas skills review handbook ● teacher made materials ● instructional videos ● quizzes ● online chapter review ● online practice test ● online test ● cumulative assessments ● benchmark tests ● performance assessment
<p>Pacing: approx # of class periods: 26</p>	

NJ Student Learning Standards for Math

MA.N-RN.A.1, MA.N-RN.A.2, MA.N-RN.A.3, MA.N-Q.1, MA.N-Q.2, MA.N-Q.3

Interdisciplinary Connections

Language Arts Literacy LA.W.8.1.B, LA.W.8.1.C, LA.W.8.1.E, LA.W.8.2.A, LA.W.8.2.B, LA. 8.2.C, LA.W.8.2.D, LA.W.8.2.F, LA.W.8.4, LA.L.8.2.B, LA.8.3.A, LA.L.8.4.C, LA.L.8.6

Career Readiness-Personal Financial Literacy PFL.9.1.8.CDM.1, PFL.9.1.8.CDM.2, PFL.9.1.8.CDM.3., PFL.9.1.8.CP.1, PFL.9.1.8.CP.1, PFL.9.1.8.FI.4

Career Awareness, Exploration, and Training WRK.9.2.8.CAP.3

Life Literacy and Key Skills TECH.9.4.8.CT.1, TECH.9.4.8.IML.4, TECH.9.4.8.TL.1, TECH. 9.4.8.TL.2, TECH. 9.4.8.TL.3

Integration of Technology

Math instruction engages students in a variety of learning experiences using technology. The following standards will be addressed through the activities in this unit:

Computer Science and Design Thinking CS.6-8.8.1.8.DA.1, CS.6-8.8.1.8.DA.4, CS.6-8.8.1.8.DA.5, CS.6-8.8.2.8.ED.2, CS.6-8.8.2.8.ED.3, CS.6-8.8.2.8.ED.7

21st Century Life and Career Skills

X	CRP1. Act as a responsible and contributing citizen and employee.
X	CRP2. Apply appropriate academic and technical skills.
X	CRP3. Attend to personal health and financial well-being.
X	CRP4. Communicate clearly and effectively and with reason.
	CRP5. Consider the environmental, social and economic impacts of decisions.
X	CRP6. Demonstrate creativity and innovation.
	CRP7. Employ valid and reliable research strategies.
X	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
	CRP9. Model integrity, ethical leadership and effective management.
	CRP10. Plan education and career paths aligned to personal goals.
X	CRP11. Use technology to enhance productivity.
	CRP12. Work productively in teams while using cultural global competence.

Evidence of Learning

Summative and Benchmark Assessments	Formative Assessments and Alternative Activities	
Unit Pretest Unit Project Unit Test Performance Assessment Beginning of the year benchmark Trimester benchmark End of year benchmark	Hand Signals Student Conference Fun and Games Class work/participation Critical Thinking Skill activity Writing about Math Textbook Interactive Activities ixl record and practice journal	Lesson Review questions Reading Check questions Share/Pair Skills Practice Study Guide Teacher Observation Unit Review Vocabulary Review Graphic Organizers Homework and Practice pages Writing Connection Content Videos Online Questions

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Instructional Delivery

Student learning experiences will include a combination of instructional strategies appropriate to the content and skills being taught. Lessons may include (but are not limited to) the following:

- Direct instruction/demonstration
- Interactive/Guided math strategies
- Cooperative learning activities
- Digital activities including videos, games, assessments
- Research projects and Presentation projects
- Small Group Instruction
- Share Examples
- Visual Aids
- Learning Centers
- Modeled, Shared, and Independent Activities
- Active Learning

Differentiated Instruction, Accommodations & Adaptations

Alternative Assessments
 Goal Setting with Students
 Homework Options
 Frequent Breaks
 Tests Read Aloud
 Color Coded Assignments/books/notebooks/folders

Cooperative Learning
 Picture Vocabulary Wall
 Anchor Charts of Concepts
 Change in Content, Process, Product
 Flexible Grouping
 Modified Class Assignments

Special Education/IEP	504
Assessments/assignments read orally w/ extended time Concept chunking Graphic organizer concept maps Picture study guides Small group instruction Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts	Extended time for assignments Frequent breaks Sign agenda book daily Study guides Graphic organizers
ELL	Gifted & Talented
Picture study guides Video presentation/Audio presentation Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts	Independent extension research projects Jigsaw cooperative learning activities Student choice Advanced Activities

Spanish pupil editions including assessments	Class grouping
At Risk/I&RS	At Risk/I&RS
<p>Presentation accommodations (changes the way information is presented)</p> <ul style="list-style-type: none"> • Listen to audio recordings instead of reading text • Learn content from videos, and digital media instead of reading print versions • Work with fewer items per page or line • Have a “designated reader”—someone who reads test questions aloud to • Hear instructions spoken aloud • Get class notes from teacher • See an outline of a lesson • Use visual presentations of verbal material, such as word webs • Get a written list of instructions <p>Response accommodations (changes the way kids complete assignments or tests)</p> <ul style="list-style-type: none"> • Give responses in a form (spoken or written) that’s easier for them • Dictate answers to a scribe who writes or types • Use a spelling dictionary or digital spell-checker • Use a laptop to type notes or give answers in class • Use a calculator or table of “math facts” <p>Setting accommodations</p> <ul style="list-style-type: none"> • Work or take a test in a different setting, such as a quiet room with few distractions • Sit where they learn best (for example, near the teacher) • Adjust lighting in the classroom • Take a test in a small group setting <p>Timing accommodations</p> <ul style="list-style-type: none"> • Take more time to complete a task or a test 	<p>Common Modifications</p> <p>Assignment modifications</p> <ul style="list-style-type: none"> • Complete fewer or different homework problems than peers • Write shorter answers to questions • Answer fewer or different test questions • Create alternate projects or assignments <p>Curriculum modifications</p> <ul style="list-style-type: none"> • Learn different material (such as continuing to work on multiplication while classmates move on to fractions) • Get graded or assessed using a different standard than other students • Be excused from particular projects <p>Scheduling accommodations</p> <ul style="list-style-type: none"> • Take more time to complete a project • Take a test in several sessions or over several days • Take sections of a test in a different order • Take a test at a specific time of day <p>Organization skills accommodations</p> <ul style="list-style-type: none"> • Mark notes with a highlighter • Use a planner or organizer to help coordinate assignments • Receive organizational skills instruction

- Have extra time to process spoken information and directions
- Take frequent breaks, such as after completing a worksheet

Internet Resources

Big Idea Math Series <https://www.bigideasmath.com/>

ixl math <https://www.ixl.com/>

prodigy <https://www.prodigygame.com/>

National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/vlibrary.html>

Internet4classrooms https://www.internet4classrooms.com/skills_6th.htm

Future Smart Financial Literacy <https://platform.everfi.net/teacher/curriculum/25/demo>

Junior Achievement <http://learn.ja.org>

Gr –Algebra Subject MATH Unit Plan 2 : ALGEBRA (Seeing Structure in Expressions and Arithmetic with Polynomials and Rational Expressions, Creating Equations, Reasoning with Equations and Inequalities)

Unit Overview

Content topic and skill focus: **ALGEBRA (Seeing Structure in Expressions and Arithmetic with Polynomials and Rational Expressions, Creating Equations, Reasoning with Equations and Inequalities)**

New Jersey Student Learning Standards

Standard, Strand, and Content statements (CPIs listed below)

Learning in this unit will focus on: **ALGEBRA (Seeing Structure in Expressions and Arithmetic with Polynomials and Rational Expressions, Creating Equations, Reasoning with Equations and Inequalities)**

Standard MA.A-SSE.A.1a, MA.A-SSE.A.1b, MA.A-SSE.A.2, MA.A-SSE.B.3a, MA.A-SSE.B.3b, MA.A-SSE.B.3c, MA.A-SSE.B.4, MA.A-APR.A.1, MA.A-APR.B.2, MA.A-APR.B2, MA.A-APR.B.3, MA.A-APR.C.4, MA.A-APR.C.5, MA.A-APR.D.6, MA.A-APR.D.7, MA.A-CED.A.1, MA.A-CED.A.2, MA.A-CED.A.3, MA.A-CED.A.4, MA.A-REI.A.1, MA.A-REI.A.2, MA.A-REI.B.3, MA.A-REI.B.4a, MA.A-REI.B.4b, MA.A-REI.C4, MA.A-REI.C.5, MA.A-REI.C.6, MA.A-REI.C.7, MA.A-REI.C.8, MA.A-REI.C.9, MA.A-REI.D.10, MA.A-REI.D.11, MA.A-REI.D.12

Content Statement: Expressions. An expression is a record of a computation with numbers, symbols that represent numbers, arithmetic operations, exponentiation, and, at more advanced levels, the operation of evaluating a function. Conventions about the use of parentheses and the order of operations assure that each expression is unambiguous. Creating an expression that describes a computation involving a general quantity requires the ability to express the computation in general terms, abstracting from specific instances.

Equations and inequalities. An equation is a statement of equality between two expressions, often viewed as a question asking for which values of the variables the expressions on either side are in fact equal. These values are the solutions to the equation. An identity, in contrast, is true for all values of the variables; identities are often developed by rewriting an expression in an equivalent form.

Instructional Focus Algebra: Seeing Structure in Expressions and Arithmetic with Polynomials and Rational Expressions, Creating Equations, Reasoning with Equations and Inequalities

Lesson #: Sections 2.1, 2.3, 2.4, 2.6, 3.5, 4.1, 4.2, 4.3, 4.4, 4.5, 6.4, 6.5, 6.6, 7.2, 7.3, 7.4, 7.6, 7.7, 7.8, 7.9, 9.1, 9.2, 9.3, 9.4, 9.5

Essential Questions:

- How can you recognize a linear equation?
- How can you describe the graph of the equation $y=mx+b$
- How can you describe the graph of the equation $ax+by=c$?
- How can you write an equation of a line when you are given the slope and a point on the line?
- How can you use a coordinate plane to solve problems involving linear inequalities?
- How can you solve a system of linear equations?
- How can you use substitution to solve a system of linear equations?
- How can you use elimination to solve a system of linear equations?
- Can a system of linear equations have no solution? Can a system of linear equations have many solutions?
- How can you sketch the graph of a system of linear inequalities?

Pacing: approx # of class periods: 52

Student Learning Objectives: STUDENTS WILL BE ABLE TO:

- MA.A-SSE.A.1 Interpret expressions that represent a quantity in terms of its context.
- MA.A-SSE.A.1a Interpret parts of an expression, such as terms, factors, and coefficients.
- Section 1.2 Students will be able to solve multi-step equations
- Section 1.3 Students will be able to model quantities
- Section 1.5 Students will be able to solve equations with variables on both sides
- Section 1.6 Students will be able to solve absolute value equations
- Section 2.1 Students will be able to write and graph inequalities
- Section 2.2 Students will be able to solve inequalities using addition or subtraction
- Section 3.3 Students will be able to solve linear functions
- Section 3.5 Students will be able to graph linear equations in standard form
- Section 3.6 Students will be able to graph linear equations in slope-intercept form
- Section 3.7 Students will be able to solve problems using transformations of linear functions
- Section 4.4 Students will be able to solve problems using scatter plots and lines of best fit
- Section 6.3 Students will be able to solve problems using exponential functions
- Section 6.4 Students will be able to solve problems using exponential growth and decay
- Section 7.1 Students will be able to add and subtract polynomials
- Section 7.3 Students will be able to solve problems using special products of polynomials
- Section 7.6 Students will be able to factor ax^2+bx+c
- Section 7.7 Students will be able to factor special products
- MA.A-SSE.A.1b. Interpret complicated expressions by viewing one or more of their parts as a single entity.
- Section 1.2 Students will be able to solve multi-step equations
- Section 2.5 Students will be able to solve compound inequalities
- Section 6.4 Students will be able to solve problems using exponential growth and decay
- Section 7.2 Students will be able to multiply and divide polynomials
- Section 7.4 Students will be able to solve polynomial equations in factored form
- MA.A-SSE.A.2 Use the structure of an expression to identify ways to rewrite it.
- Section 7.2 Students will be able to multiply and divide polynomials
- Section 7.3 Students will be able to solve problems using special products of polynomials
- Section 7.5 Students will be able to solve problems by factoring x^2+bx+c
- Section 7.6 Students will be able to factor ax^2+bx+c

- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.5 Students will be able to solve problems using intercept form
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 9.6 Students will be able to solve nonlinear systems of equations
- Section 10.3 Students will be able to solve radical equations
- MA.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.
- MA.A-SSE.B.3a. Factor a quadratic expression to reveal the zeros of the function it defines.
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to Factor $x^2 + bx + c$
- Section 7.6 Students will be able to Factoring $a^2 + bx + c$
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.5 Students will be able to use intercept form
- Section 9.5 Students will be able to solve quadratic equations using quadratic formula
- MA.A-SSE.B.3b. Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
- Section 9.4 Students will be able to Solve Quadratic Equations by Completing the Square
- MA.A-SSE.B.3c. Use the properties of exponents to transform expressions for exponential functions.
- Section 6.4 Students will be able to solve problems using exponential growth and decay
- Section 6.5 Students will be able to solve exponential equations
- MA.A-APR.A.1 Understand that polynomials form a system analogous to the integers, namely, they are closed under the operations of addition, subtraction, and multiplication; add, subtract, and multiply polynomials.
- Section 7.1 Students will be able to Add and Subtract Polynomials
- Section 7.2 Students will be able to multiply and divide polynomials
- Section 7.3 Students will be able to solve problems using Special Products of Polynomials
- Section 7.5 Students will be able to Factor $x^2 + bx + c$
- Section 8.5 Students will be able to use intercept form
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- MA.A-APR.A.3
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to Factor $x^2 + bx + c$
- Section 7.6 Students will be able to Factoring $a^2 + bx + c$
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.5 Students will be able to use intercept form
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Domain: Creating Equations
- MA.A-CED.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.
- Section 1.1 Students will be able to Solving Simple Equations
- Section 1.2 Students will be able to Solving Multi-Step Equations
- Section 1.3 Students will be able to model quantities
- Section 1.5 Students will be able to solve equations with variables on both sides
- Section 1.6 Students will be able to solve absolute value equations
- Section 1.7 Students will be able to rewrite equations and formulas
- Section 2.1 Students will be able to write and graph inequalities
- Section 2.2 Students will be able to solve inequalities using addition or subtraction

- Section 2.3 Students will be able to solve inequalities using multiplication or division
- Section 2.4 Students will be able to solve multi-step inequalities
- Section 2.5 Students will be able to solve compound inequalities
- Section 2.6 Students will be able to solve absolute value inequalities
- Section 3.4 Students will be able to solve problems using function notation
- Section 6.5 Students will be able to solve exponential equations
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to factor x^2+bx+c
- Section 7.6 Students will be able to factoring $a^2 + bx + c$
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.4 Students will be able to graph $f(x)=a(x-h)^2+k$
- Section 8.5 Students will be able to use intercept form
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- Section 9.1 Students will be able to solve problems using properties of radicals
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 9.6 Students will be able to solve nonlinear systems of equations
- Section 10.1 Students will be able to graph square root functions
- Section 10.2 Students will be able to graph cube root functions
- Section 10.3 Students will be able to solve radical equations
- MA.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.
- Section 3.1 Students will be able to solve problems using functions
- Section 3.3 Students will be able to solve linear functions
- Section 3.4 Students will be able to solve problems using function notation
- Section 3.5 Students will be able to graph linear functions in standard form
- Section 3.6 Students will be able to graph linear functions in slope-intercept form
- Section 3.7 Students will be able to transformations of linear functions
- Section 3.8 Students will be able to graph absolute value functions
- Section 4.1 Students will be able to write equations in slope-intercept form
- Section 4.2 Students will be able to write equations in point-slope form
- Section 4.3 Students will be able to write equations of parallel and perpendicular lines
- Section 4.4 Students will be able to solve problems using scatter plots and lines of fit
- Section 4.5 Students will be able to analyze lines of fit
- Section 4.6 Students will be able to solve problems with arithmetic sequences
- Section 4.7 Students will be able to solve problems using piecewise functions
- Section 5.1 Students will be able to solve system of linear equations by graphing
- Section 5.2 Students will be able to solve systems of linear equations by substitution
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- Section 5.4 Students will be able to solve special systems of linear equations
- Section 5.5 Students will be able to solve equations by graphing
- Section 5.6 Students will be able to graph linear equations in two variables
- Section 5.7 Students will be able to solve systems of linear inequalities
- Section 6.3 Students will be able to solve problems involving exponential functions
- Section 6.4 Students will be able to solve problems using exponential growth and decay
- Section 6.5 Students will be able to solve exponential equations
- Section 6.6 Students will be able to solve geometric sequences
- Section 6.7 Students will be able to solve recursively designed sequences
- Section 8.1 Students will be able to graph $f(x)=ax^2$
- Section 8.2 Students will be able to graph $f(x)=ax^2+bx+c$
- Section 8.3 Students will be able to graph $f(x)=ax^2+bx+c$

- Section 8.4 Students will be able to graph $f(x)=a(x-h)^2+k$
- Section 8.5 Students will be able to solve problems using intercept form
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 10.1 Students will be able to graph square root functions
- Section 10.2 Students will be able to graph cube root functions
- Section 10.3 Students will be able to solve radical equations
- Section 10.4 Students will be able to solve inverse of a function
- MA.A-CED.A.3 Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or non-viable options in a modeling context.
- Section 5.1 Students will be able to solve system of linear equations by graphing
- Section 5.2 Students will be able to solve systems of linear equations by substitution
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- Section 5.4 Students will be able to solve special systems of linear equations
- Section 5.5 Students will be able to solve equations by graphing
- Section 5.6 Students will be able to graph linear equations in two variables
- Section 5.7 Students will be able to solve systems of linear inequalities
- Section 7.5 Students will be able to Factor $x^2 + bx + c$
- Section 7.6 Students will be able to factor ax^2+bx+c
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.4 Students will be able to graph $f(x)=a(x-h)^2+k$
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- MA.A-CED.A.4 Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations.
- Section 1.7 Students will be able to rewrite equations and formulas
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 10.4 Students will be able to find the inverse of a function
- Domain: Reasoning with Equations and Inequalities
- MA.A-REI.A.1 Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.
- Section 1.1 Students will be able to solve simple equations
- Section 1.2 Students will be able to solve multi-step equations
- Section 1.3 Students will be able to model quantities
- Section 1.5 Students will be able to solve equations with variables on both sides
- Section 1.6 Students will be able to solve absolute value equations
- Section 1.7 Students will be able to rewrite equations and formulas
- Section 3.4 Students will be able to solve problems using function notation
- Section 3.5 Students will be able to graph linear functions in standard form
- Section 4.6 Students will be able to solve problems with arithmetic sequences
- Section 4.7 Students will be able to solve problems using piecewise functions
- Section 5.2 Students will be able to solve systems of linear equations by substitution
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- Section 5.4 Students will be able to solve special systems of linear equations
- Section 6.5 Students will be able to solve exponential equations
- Section 6.6 Students will be able to solve geometric sequences
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to Factor $x^2 + bx + c$

- Section 7.6 Students will be able to factor ax^2+bx+c
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 8.4 Students will be able to graph $f(x)=a(x-h)^2+k$
- Section 8.5 Students will be able to solve problems using intercept form
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- Section 9.1 Students will be able to solve problems using properties of radicals
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 9.6 Students will be able to solve nonlinear systems of equations
- Section 10.3 Students will be able to solve radical equations
- MA.A-REI.B.3 Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.
- Section 1.1 Students will be able to solve simple equations
- Section 1.2 Students will be able to solve multi-step equations
- Section 1.3 Students will be able to model quantities
- Section 1.5 Students will be able to solve equations with variables on both sides
- Section 1.6 Students will be able to solve absolute value equations
- Section 1.7 Students will be able to rewrite equations and formulas
- Section 2.2 Students will be able to solve inequalities using addition or subtraction
- Section 2.3 Students will be able to solve inequalities using multiplication or division
- Section 2.4 Students will be able to solve multi-step inequalities
- Section 2.5 Students will be able to solve compound inequalities
- Section 2.6 Students will be able to solve absolute value inequalities
- Section 3.4 Students will be able to solve problems using function notation
- Section 3.5 Students will be able to graph linear functions in standard form
- Section 4.3 Students will be able to write equations of parallel and perpendicular lines
- Section 4.7 Students will be able to solve problems using piecewise functions
- Section 5.2 Students will be able to solve systems of linear equations by substitution
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- Section 5.4 Students will be able to solve special systems of linear equations
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to Factor $x^2 + bx + c$
- Section 7.6 Students will be able to factor ax^2+bx+c
- Section 8.4 Students will be able to graph $f(x)=a(x-h)^2+k$
- Section 8.5 Students will be able to solve problems using intercept form
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- Section 9.1 Students will be able to solve problems using properties of radicals
- Section 9.6 Students will be able to solve nonlinear systems of equations
- Section 10.1 Students will be able to graph square root functions
- Section 10.3 Students will be able to solve radical equations
- MA.A-REI.B.4 Solve quadratic equations in one variable.
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- MA.A-REI.B.4 a. Use the method of completing the square to transform any quadratic equation in x into an equation of the form $(x - p)^2 = q$ that has the same solutions. Derive the quadratic formula from this form.
- MA.A-REI.B.4 b. Solve quadratic equations by inspection (e.g., for $x^2 = 49$), taking square roots, completing the square, the quadratic formula and factoring, as appropriate to the initial form of the equation. Recognize when the quadratic formula gives complex solutions [and write them as $a \pm bi$ for real numbers a and b]*.
- Section 7.4 Students will be able to solve polynomial equations in factored form
- Section 7.5 Students will be able to Factor $x^2 + bx + c$

- Section 7.6 Students will be able to factor ax^2+bx+c
- Section 7.7 Students will be able to factor special products
- Section 7.8 Students will be able to factor polynomials completely
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.4 Students will be able to solve quadratic equations by completing the square
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 10.3 Students will be able to solve radical equations
- MA.A-REI.C.5 Prove that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions.
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- MA.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.
- Section 5.1 Students will be able to solve systems of linear equations by graphing
- Section 5.2 Students will be able to solve systems of linear equations by substitution
- Section 5.3 Students will be able to solve systems of linear equations by elimination
- Section 5.4 Students will be able to solve special systems of linear equations
- Section 5.5 Students will be able to solve equations by graphing
- MA.A-REI.C.7 Solve a simple system consisting of a linear equation and a quadratic equation in two variables algebraically and graphically.
- Section 9.6 Students will be able to solve nonlinear systems of equations
- MA.A-REI.D.10 Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).
- Section 3.3 Students will be able to solve problems with linear functions
- Section 3.8 Students will be able to graph absolute value functions
- Section 4.7 Students will be able to solve piecewise functions
- Section 6.3 Students will be able to solve exponential functions
- Section 8.1 Students will be able to graph $f(x)=ax^2$
- Section 10.1 Students will be able to graph square root functions
- Section 10.2 Students will be able to graph cube root functions
- Section 10.3 Students will be able to solve radical equations
- MA.A-REI.D.11 Explain why the x-coordinates of the points where the graph of the equation $y = f(x)$ and $y = g(x)$ intersect are the solutions of the equation $f(x) = g(x)$; find the solutions approximately, e.g., using technology to graph the functions, make tables of values, or find successive approximations. Include cases where $f(x)$ and/or $g(x)$ are linear, [polynomial, rational, absolute value,] exponential, [and logarithmic functions].
- Section 5.5 Students will be able to solve equations by graphing
- Section 6.5 Students will be able to solve exponential equations
- Section 6.6 Students will be able to solve geometric sequences
- Section 8.6 Students will be able to compare linear, exponential, and quadratic functions
- Section 9.2 Students will be able to solve quadratic equations by graphing
- Section 9.3 Students will be able to solve quadratic equations by using square roots
- Section 9.5 Students will be able to solve quadratic equations using the quadratic formula
- Section 9.6 Students will be able to solve nonlinear system of equations
- Section 10.2 Students will be able to graph cube root functions
- Section 10.3 Students will be able to solve radical equations

- MA.A-REI.12 Graph the solutions to a linear inequalities 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.
- Section 5.6 Students will be able graph linear inequalities in two variables
- Section 5.7 Students will be able to solve systems of linear inequalities

Suggested Activities	Instructional Materials/Resources
<ul style="list-style-type: none"> ● Introduction videos ● ixl ● graphic organizers ● scavenger hunts ● flash cards ● My Dear Aunt Sally Game ● online questions correlated to textbook ● online textbook lesson ● Stem Videos 	<ul style="list-style-type: none"> ● Big Ideas Math Textbook copyright 2022 ● Big Ideas record and practice journal ● Big Ideas resource by chapter workbook ● Big Ideas skills review handbook ● teacher made materials ● instructional videos ● quizzes ● online chapter review ● online practice test ● online test ● cumulative assessments ● benchmark tests ● performance assessment

NJ Student Learning Standards for Math: MA.A-SSE.A.1, MA.A-SSE.A.2, MA.A-SSE.B.3, MA.A-APR.A.1, MA.A-CED.A.1, MA.A-CED.A.2, MA.A-CED.A.3, MA.A-CED.A.4, MA.A-REI.A.1, MA.A-REI.B.3, MA.A-REI.B.4, MA.A-REI.C.5, MA.A-REI.C.6, MA.A-REI.C.7, MA.A-REI.D.10, MA.A-REI.D.11, MA.A-REI.D.12

Interdisciplinary Connections

Language Arts Literacy LA.W.7.1.B, LA.W.7.1.C, LA.W.7.1.E, LA.W.7.2.A, LA.W.7.2.B, LA. 7.2.C, LA.W.7.2.D, LA.W.7.2.F, LA.W.7.4, LA.L.7.2.B, LA.7.3.A, LA.L.7.4.C, LA.L.7.6

Career Readiness-Personal Financial Literacy PFL.9.1.8.CDM.1, PFL.9.1.8.CDM.2, PFL.9.1.8.CDM.3., PFL.9.1.8.CP.1, PFL.9.1.8.CP.1, PFL.9.1.8.FI.4

Career Awareness, Exploration, and Training WRK.9.2.8.CAP.3

Life Literacy and Key Skills TECH.9.4.8.CT.1, TECH.9.4.8.IML.4, TECH.9.4.8.TL.1, TECH. 9.4.8.TL.2, TECH. 9.4.8.TL.3

Integration of Technology

Math instruction engages students in a variety of learning experiences using technology. The following standards will be addressed through the activities in this unit:

Computer Science and Design Thinking CS.6-8.8.1.8.DA.1, CS.6-8.8.1.8.DA.4, CS.6-8.8.1.8.DA.5, CS.6-8.8.2.8.ED.2, CS.6-8.8.2.8.ED.3, CS.6-8.8.2.8.ED.7

21st Century Life and Career Skills

X	CRP1. Act as a responsible and contributing citizen and employee.
X	CRP2. Apply appropriate academic and technical skills.
X	CRP3. Attend to personal health and financial well-being.
X	CRP4. Communicate clearly and effectively and with reason.
	CRP5. Consider the environmental, social and economic impacts of decisions.
X	CRP6. Demonstrate creativity and innovation.
	CRP7. Employ valid and reliable research strategies.
X	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
	CRP9. Model integrity, ethical leadership and effective management.
	CRP10. Plan education and career paths aligned to personal goals.
X	CRP11. Use technology to enhance productivity.
	CRP12. Work productively in teams while using cultural global competence.

Evidence of Learning

Summative and Benchmark Assessments	Formative Assessments and Alternative Activities
Unit Pretest Unit Project Unit Test Performance Assessment Beginning of the year benchmark Trimester benchmark End of year benchmark	Hand Signals Student Conference Fun and Games Class work/participation Critical Thinking Skill activity Writing about Math Textbook Interactive Activities ixl record and practice journal Lesson Review questions Reading Check questions Share/Pair Skills Practice Study Guide Teacher Observation Unit Review Vocabulary Review Graphic Organizers Homework and Practice pages Writing Connection Content Videos Online Questions

Instructional Delivery

Student learning experiences will include a combination of instructional strategies appropriate to the content and skills being taught. Lessons may include (but are not limited to) the following:

- Direct instruction/demonstration
- Interactive/Guided math strategies
- Cooperative learning activities
- Digital activities including videos, games, assessments
- Research projects and Presentation projects
- Small Group Instruction

- Share Examples
- Visual Aids
- Learning Centers
- Modeled, Shared, and Independent Activities
- Active Learning

Differentiated Instruction, Accommodations & Adaptations

Alternative Assessments
 Goal Setting with Students
 Homework Options
 Frequent Breaks
 Tests Read Aloud
 Color Coded Assignments/books/notebooks/folders

Cooperative Learning
 Picture Vocabulary Wall
 Anchor Charts of Concepts
 Change in Content, Process, Product
 Flexible Grouping
 Modified Class Assignments

Special Education/IEP	504
Assessments/assignments read orally w/ extended time Concept chunking Graphic organizer concept maps Picture study guides Small group instruction Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts	Extended time for assignments Frequent breaks Sign agenda book daily Study guides Graphic organizers
ELL	Gifted & Talented
Picture study guides Video presentation/Audio presentation Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts Spanish pupil editions including assessments	Independent extension research projects Jigsaw cooperative learning activities Student choice Advanced Activities Class grouping
At Risk/I&RS Presentation accommodations (changes the way information is presented) <ul style="list-style-type: none"> ● Listen to audio recordings instead of reading text ● Learn content from videos, and digital media instead of reading print versions ● Work with fewer items per page or line ● Have a “designated reader”—someone who reads test questions aloud to 	At Risk/I&RS Common Modifications Assignment modifications <ul style="list-style-type: none"> ● Complete fewer or different homework problems than peers ● Write shorter answers to questions ● Answer fewer or different test questions ● Create alternate projects or assignments

- Hear instructions spoken aloud
- Get class notes from teacher
- See an outline of a lesson
- Use visual presentations of verbal material, such as word webs
- Get a written list of instructions

Response accommodations (changes the way kids complete assignments or tests)

- Give responses in a form (spoken or written) that's easier for them
- Dictate answers to a scribe who writes or types
- Use a spelling dictionary or digital spell-checker
- Use a laptop to type notes or give answers in class
- Use a calculator or table of "math facts"

Setting accommodations

- Work or take a test in a different setting, such as a quiet room with few distractions
- Sit where they learn best (for example, near the teacher)
- Adjust lighting in the classroom
- Take a test in a small group setting

Timing accommodations

- Take more time to complete a task or a test
- Have extra time to process spoken information and directions
- Take frequent breaks, such as after completing a worksheet

Curriculum modifications

- Learn different material (such as continuing to work on multiplication while classmates move on to fractions)
- Get graded or assessed using a different standard than other students
- Be excused from particular projects

Scheduling accommodations

- Take more time to complete a project
- Take a test in several sessions or over several days
- Take sections of a test in a different order
- Take a test at a specific time of day

Organization skills accommodations

- Mark notes with a highlighter
- Use a planner or organizer to help coordinate assignments
- Receive organizational skills instruction

Internet Resources

Big Idea Math Series <https://www.bigideasmath.com/>

ixl math <https://www.ixl.com/>

prodigy <https://www.prodigygame.com/>

National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/vlibrary.html>

Internet4classrooms https://www.internet4classrooms.com/skills_6th.htm

Future Smart Financial Literacy <https://platform.everfi.net/teacher/curriculum/25/demo>

Gr –Algebra Subject MATH Unit Plan 3 : Functions (Interpreting Functions, Building Functions, Linear Quadratic, and Exponential Models

Unit Overview

Content topic and skill focus: Functions (Interpreting Functions, Building Functions, Linear Quadratic, and Exponential Models
New Jersey Student Learning Standards

Standard, Strand, and Content statements (CPIs listed below)

Learning in this unit will focus on: **Functions (Interpreting Functions, Building Functions, Linear Quadratic, and Exponential Models**

Standard MA.F-IF.A.1,MA.F-IF.A.2,MA.F-IF.A.3, MA.F-IF.B.4, MA.F-IF.B.5, MA.F-IF.B.6, MA.F-IF.C7a, MA.F-IF.C7b, MA.F-IF.C7c, MA.F-IF.C.7c, MA.F-IF.C7d, MA.F-IF.C7e, MA.F-IF.C.8.a, MA.F-IF.C.8b, MA.F-IF.C.9, MA.F-BF.A.1a, MA.F-BF.A1b, MA.F-BF.A1c, MA.F-BF.A.2, MA.F-BF.B3, MA.F-BF.B.4a, MA.F-BF.B.4b, MA.F-BF.B.4b, MA.F-BF.B.4c, MA.F-BF.B.4d, MA.F-BF.B.5, MA.F-LE.A.1a, MA.F-LE.A.1b, MA.F-LE.A.1c, MA.F-LE.A.2, MA.F-LE.A.3, MA.F-LE.A.4,MA.F-LE.A.5

Content Statement:Connections to Functions and Modeling. Expressions can define functions, and equivalent expressions define the same function. Asking when two functions have the same value for the same input leads to an equation; graphing the two functions allows for finding approximate solutions of the equation. Converting a verbal description to an equation, inequality, or system of these is an essential skill in modeling.

Instructional Focus: Functions (Interpreting Functions, Building Functions, Linear Quadratic, and Exponential Models

Lesson #: Sections 3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7,5.1, 5.4,5.6, 6.3, 6.4,6.5, 6.6,6.7, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 9.2, 9.4, 9.5, 9.6, 10.1, 10.2, 10.3, 10.4

Essential Questions:

- How can the slope of a line be used to describe the line?
- How can you describe the graph of the equation $y=mx+b$?
- How can you describe the graph of the equation $ax+by=c$?
- How can you write an equation of a line when you are given the slope and y-intercept of the line?
- How can you write an equation of a line when you are given the slope and a point on the line?
- How can you find the domain and range of a function?
- How can you decide whether the domain of a function is discrete or continuous?
- How can you use a linear function to describe a linear pattern?
- How can you use function notation to represent a function?
- How can you recognize when a pattern in real life is linear or nonlinear?
- How are arithmetic sequences used to describe patterns?

Student Learning Objectives:

- MA.F-IF.A.1 **Students will be able to:**Understand that a function from one set (called the domain) to another set (called the range) assigns to each element of the domain exactly one element of the range. If f is a function and x is an element of its domain, then $f(x)$ denotes the output of f corresponding to the input x . The graph of f is the graph of the equation $y = f(x)$.

- Sections 3.1, 3.2, 3.3, 3.4,3.6, 3.7, 3.8, 4.1,4.2, 4.6, 4.7, 6.3, 6.4, 6.6, 8.1, 8.2,8.3, 8.4, 8.5, 8.6, 10.1, 10.2
- MA.F-IF.A.2 **Students will be able to:** Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.
- Sections 3.4, 3.6, 3.7, 3.8,4.1, 4.2, 4.6, 4.7,6.3, 6.4, 6.6, 8.1, 8.2, 8.3, 8.4, 8.5,8.6, 9.2, 9.4, 9.6, 10.1, 10.2, 10.4
- MA.F-IF.A.3 **Students will be able to:** Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.
- Sections 4.6, 6.6, 6.7
- MA.F-IF.B.4 **Students will be able to:**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].
- Sections 3.2, 3.3, 3.4, 3.5,3.6, 3.8, 4.1, 4.4,4.7, 6.3, 6.4, 8.1, 8.2, 8.3, 8.4, 8.5,8.6, 9.2, 9.4, 9.5, 10.1, 10.2
- MA.F-IF.B.5 **Students will be able to:**Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes.
- 3.1, 3.3, 3.4, 3.5, 3.6, 3.7, 3.8, 4.7, 5.1, 5.4, 5.6, 6.3, 8.1, 8.2, 8.3, 8.4, 8.5, 10.4
- MA.F-IF.B.6 **Students will be able to:**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.
- Sections 8.6, 10.1, 10.2
- MA.F-IF.C.7 **Students will be able to:**Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.
- MA.F-IF.C.7a. **Students will be able to:**Graph linear and quadratic functions and show intercepts, maxima, and minima.
- Sections 3.3, 3.4, 3.5, 3.6,3.7, 4.3, 4.5, 4.6, 4.7, 5.1, 5.2, 5.4, 5.5, 5.6, 5.7, 6.5, 8.1, 8.2, 8.3, 8.4, 8.5, 8.6, 9.2, 9.3, 9.4, 9.5, 9.6, 10.4
- MA.F-IF.C.7b. **Students will be able to:**Graph square root, [cube root,] and piecewise-defined functions, including step functions and absolute value functions.
- Sections 3.8, 4.7, 6.4, 10.1, 10.2, 10.3, 10.4
- MA.F-IF.C.7e.**Students will be able to:** Graph exponential [and logarithmic] functions, showing intercepts and end behavior, [and trigonometric functions, showing period, midline, and amplitude].
- Sections 6.3, 6.4
- MA.F-IF.C.8 **Students will be able to:**Write a function defined by an expression in different but equivalent forms to reveal and explain different properties of the function.
- MA.F-IF.C.8a. **Students will be able to:**Use the process of factoring and completing the square in a quadratic function to show zeros, extreme values, and symmetry of the graph, and interpret these in terms of a context.
- Sections 8.5, 9.4
- MA.F-IF.C.8b. **Students will be able to:**Use the properties of exponents to interpret expressions for exponential functions.
- Section 6.4
- MA.F-IF.C.9 **Students will be able to:**Compare properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions).
- Section 3.2, 3.3, 3.4, 3.6, 4.2, 6.3, 8.1, 8.3, 8.6, 10.1, 10.2
- MA.F-BF.A.1a **Students will be able to:**Write a function that describes a relationship between two quantities. a. Determine an explicit expression, a recursive process, or steps for calculation from a context. Found throughout.
- Section 3.1, 4.1, 4.2, 4.4, 4.5, 4.6, 6.3, 6.4,6.6, 6.7, 8.4, 8.5, 8.6, 9.2, 10.4

- MA.F-BF.A.1b. **Students will be able to:**Combine standard function types using arithmetic operations.
- Section 6.4, 8.2
- MA.F-BF.A.1c **Students will be able to:**Compose functions.
- MA.F-BF.B.2 **Students will be able to:**Write arithmetic and geometric sequences both recursively and with an explicit formula, use them to model situations, and translate between the two forms.
- Section 4.6, 6.6, 6.7
- MA.F-BF.B.3 **Students will be able to:**Identify the effect on the graph of replacing $f(x)$ by $f(x) + k$, $k f(x)$, $f(kx)$, and $f(x + k)$ for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. [Include recognizing even and odd functions from their graphs and algebraic expressions for them.]
- Section 3.7, 3.8, 4.1, 4.2, 4.3, 6.3, 6.4, 8.1, 8.2, 8.3, 8.4, 10.1, 10.2
- MA.F-BF.B.4 **Students will be able to:**Find inverse functions.
- MA.F-BF.B.4a. **Students will be able to:**Solve an equation of the form $f(x) = c$ for a simple function f that has an inverse and write an expression for the inverse.
- Section Section 10.4
- MA.F-LE.A.1 **Students will be able to:**Distinguish between situations that can be modeled with linear functions and with exponential functions.
- MA.F-LE.A.1a. **Students will be able to:**Prove that linear functions grow by equal differences over equal intervals; and that exponential functions grow by equal factors over equal intervals.
- Section 3.6, 6.3
- MA.F-LE.A.1b. **Students will be able to:**Recognize situations in which one quantity changes at a constant rate per unit interval relative to another.
- Section 3.3, 4.1, 4.2, 6.7, 8.6
- MA.F-LE.A.1c **Students will be able to:** Recognize situations in which a quantity grows or decays by a constant percent rate per unit interval relative to another.
- Section 6.3, 6.4, 6.7, 8.6
- MA.F-LE.A.2 **Students will be able to:**Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).
- Section 3.1, 4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7, 5.1, 5.2, 5.3, 5.4, 5.5, 5.6, 5.7, 6.3, 6.4, 6.5, 6.6, 6.7, 8.6
- MA.F-LE.3 **Students will be able to:**Observe using graphs and tables that a quantity increasing exponentially eventually exceeds a quantity increasing linearly, quadratically, [or (more generally) as a polynomial function].
- Section 8.6
- MA.F-LE.5 **Students will be able to:**Interpret the parameters in a linear or exponential function in terms of a context.
- Section 3.6, 4.4, 4.5, 6.3, 6.4

Suggested Activities

- Introduction videos
- ixl
- graphic organizers
- scavenger hunts
- flash cards
- My Dear Aunt Sally Game
- online questions correlated to textbook
- online textbook lesson
- Stem Videos

Instructional Materials/Resources

- Big Ideas Math Textbook copyright 2022
- Big Ideas record and practice journal
- Big Ideas resource by chapter workbook
- Big Ideas skills review handbook
- teacher made materials
- instructional videos
- quizzes
- online chapter review
- online practice test
- online test
- cumulative assessments

	<ul style="list-style-type: none"> ● benchmark tests ● performance assessment
Pacing: approx # of class periods: 46	

NJ Student Learning Standards for Math: MA.F-IF.A.1, MA.F-IF.A.2, MA.F-IF.A.3, MA.F-IF.B.4, MA.F-IF.B.5, MA.F-IF.B.6, MA.F-IF.C7a, MA.F-IF.C7b, MA.F-IF.C7c, MA.F-IF.C.7c, MA.F-IF.C7d, MA.F-IF.C7e, MA.F-IF.C.8.a, MA.F-IF.C.8b, MA.F-IF.C.9, MA.F-BF.A.1a, MA.F-BF.A.2, MA.F-BF.B3, MA.F-BF.B.4a, MA.F-BF.B.4b, MA.F-BF.B.4b, MA.F-BF.B.4c, MA.F-BF.B.4d, MA.F-BF.B.5, MA.F-LE.A.1a, MA.F-LE.A.1b, MA.F-LE.A.1c, MA.F-LE.A.2, MA.F-LE.A.3, MA.F-LE.A.5

Interdisciplinary Connections

Language Arts Literacy LA.W.7.1.B, LA.W.7.1.C, LA.W.7.1.E, LA.W.7.2.A, LA.W.7.2.B, LA. 7.2.C, LA.W.7.2.D, LA.W.7.2.F, LA.W.7.4, LA.L.7.2.B, LA.7.3.A, LA.L.7.4.C, LA.L.7.6

Career Readiness-Personal Financial Literacy PFL.9.1.8.CDM.1, PFL.9.1.8.CDM.2, PFL.9.1.8.CDM.3., PFL.9.1.8.CP.1, PFL.9.1.8.CP.1, PFL.9.1.8.FI.4

Career Awareness, Exploration, and Training WRK.9.2.8.CAP.3

Life Literacy and Key Skills TECH.9.4.8.CT.1, TECH.9.4.8.IML.4, TECH.9.4.8.TL.1, TECH. 9.4.8.TL.2, TECH. 9.4.8.TL.3

Integration of Technology

Math instruction engages students in a variety of learning experiences using technology. The following standards will be addressed through the activities in this unit:

Computer Science and Design Thinking CS.6-8.8.1.8.DA.1, CS.6-8.8.1.8.DA.4, CS.6-8.8.1.8.DA.5, CS.6-8.8.2.8.ED.2, CS.6-8.8.2.8.ED.3, CS.6-8.8.2.8.ED.7

21st Century Life and Career Skills

X	CRP1. Act as a responsible and contributing citizen and employee.
X	CRP2. Apply appropriate academic and technical skills.
X	CRP3. Attend to personal health and financial well-being.
X	CRP4. Communicate clearly and effectively and with reason.
	CRP5. Consider the environmental, social and economic impacts of decisions.
X	CRP6. Demonstrate creativity and innovation.

	CRP7. Employ valid and reliable research strategies.
X	CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
	CRP9. Model integrity, ethical leadership and effective management.
	CRP10. Plan education and career paths aligned to personal goals.
X	CRP11. Use technology to enhance productivity.
	CRP12. Work productively in teams while using cultural global competence.

Evidence of Learning

Summative and Benchmark Assessments	Formative Assessments and Alternative Activities
Unit Pretest Unit Project Unit Test Performance Assessment Beginning of the year benchmark Trimester benchmark End of year benchmark	Hand Signals Student Conference Fun and Games Class work/participation Critical Thinking Skill activity Writing about Math Textbook Interactive Activities ixl record and practice journal Lesson Review questions Reading Check questions Share/Pair Skills Practice Study Guide Teacher Observation Unit Review Vocabulary Review Graphic Organizers Homework and Practice pages Writing Connection Content Videos Online Questions

Instructional Delivery

Student learning experiences will include a combination of instructional strategies appropriate to the content and skills being taught. Lessons may include (but are not limited to) the following:

- Direct instruction/demonstration
- Interactive/Guided math strategies
- Cooperative learning activities
- Digital activities including videos, games, assessments
- Research projects and Presentation projects
- Small Group Instruction
- Share Examples
- Visual Aids
- Learning Centers
- Modeled, Shared, and Independent Activities
- Active Learning

Differentiated Instruction, Accommodations & Adaptations

Alternative Assessments
 Goal Setting with Students
 Homework Options
 Frequent Breaks
 Tests Read Aloud
 Color Coded Assignments/books/notebooks/folders

Cooperative Learning
 Picture Vocabulary Wall
 Anchor Charts of Concepts
 Change in Content, Process, Product
 Flexible Grouping
 Modified Class Assignments

Special Education/IEP	504
Assessments/assignments read orally w/ extended time Concept chunking Graphic organizer concept maps Picture study guides Small group instruction Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts	Extended time for assignments Frequent breaks Sign agenda book daily Study guides Graphic organizers
ELL	Gifted & Talented
Picture study guides Video presentation/Audio presentation Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts Spanish pupil editions including assessments	Independent extension research projects Jigsaw cooperative learning activities Student choice Advanced Activities Class grouping
At Risk/I&RS	At Risk/I&RS
<p>Presentation accommodations (changes the way information is presented)</p> <ul style="list-style-type: none"> ● Listen to audio recordings instead of reading text ● Learn content from videos, and digital media instead of reading print versions ● Work with fewer items per page or line ● Have a “designated reader”—someone who reads test questions aloud to ● Hear instructions spoken aloud ● Get class notes from teacher ● See an outline of a lesson ● Use visual presentations of verbal material, such as word webs ● Get a written list of instructions <p>Response accommodations (changes the way kids complete assignments or tests)</p>	<p>Common Modifications</p> <p>Assignment modifications</p> <ul style="list-style-type: none"> ● Complete fewer or different homework problems than peers ● Write shorter answers to questions ● Answer fewer or different test questions ● Create alternate projects or assignments <p>Curriculum modifications</p> <ul style="list-style-type: none"> ● Learn different material (such as continuing to work on multiplication while classmates move on to fractions) ● Get graded or assessed using a different standard than other students ● Be excused from particular projects

<ul style="list-style-type: none"> ● Give responses in a form (spoken or written) that's easier for them ● Dictate answers to a scribe who writes or types ● Use a spelling dictionary or digital spell-checker ● Use a laptop to type notes or give answers in class ● Use a calculator or table of "math facts" <p>Setting accommodations</p> <ul style="list-style-type: none"> ● Work or take a test in a different setting, such as a quiet room with few distractions ● Sit where they learn best (for example, near the teacher) ● Adjust lighting in the classroom ● Take a test in a small group setting <p>Timing accommodations</p> <ul style="list-style-type: none"> ● Take more time to complete a task or a test ● Have extra time to process spoken information and directions ● Take frequent breaks, such as after completing a worksheet 	<p>Scheduling accommodations</p> <ul style="list-style-type: none"> ● Take more time to complete a project ● Take a test in several sessions or over several days ● Take sections of a test in a different order ● Take a test at a specific time of day <p>Organization skills accommodations</p> <ul style="list-style-type: none"> ● Mark notes with a highlighter ● Use a planner or organizer to help coordinate assignments ● Receive organizational skills instruction
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Internet Resources

Big Idea Math Series <https://www.bigideasmath.com/>

ixl math <https://www.ixl.com/>

prodigy <https://www.prodigygame.com/>

National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/vlibrary.html>

Internet4classrooms https://www.internet4classrooms.com/skills_6th.htm

Future Smart Financial Literacy <https://platform.everfi.net/teacher/curriculum/25/demo>

Junior Achievement <http://learn.ja.org>

Gr –Algebra Subject MATH Unit Plan 4: Statistics and Probability (Interpreting Categorical and Quantitative Data)

Unit Overview

Content topic and skill focus: **Statistics and Probability (Interpreting Categorical and Quantitative Data)**

Standard, Strand, and Content statements (CPIs listed below)

Learning in this unit will focus on: **Statistics and Probability (Interpreting Categorical and Quantitative Data)**

Standard MA.S-ID.A.1, MA.S-ID.A.2, MA.S-ID.A.3, MA.S-ID.A.4, MA.S-ID.B.5, MA.S-ID.B.6a, MA.S-ID.B.6b, MA.S-ID.B.6c, MA.S-ID.C.7, MA.S-ID.C.8, MA.S-ID.C.9

Content Statement: Decisions or predictions are often based on data—numbers in context. These decisions or predictions would be easy if the data always sent a clear message, but the message is often obscured by variability.

Statistics provides tools for describing variability in data and for making informed decisions that take it into account. Data are gathered, displayed, summarized, examined, and interpreted to discover patterns and deviations from patterns. Quantitative data can be described in terms of key characteristics: measures of shape, center, and spread. The shape of a data distribution might be described as symmetric, skewed, flat, or bell shaped, and it might be summarized by a statistical measuring center (such as mean or median) and a statistical measuring spread (such as standard deviation or interquartile range). Different distributions can be compared numerically using these statistics or compared visually using plots. Knowledge of center and spread are not enough to describe a distribution. Which statistics to compare, which plots to use, and what the results of a comparison might mean, depend on the question to be investigated and the real-life actions to be taken.

Instructional Focus: Statistics and Probability

Lesson #: Sections 4.4, 4.5, 6.3, 9.2, 11.1, 11.2, 11.3, 11.4, 11.5

Essential Questions:

- How can you use measures of central tendency to distribute an amount evenly among a group of people?
- How can you measure the dispersion of a data set?
- How can you use a box-and-whisker plot to describe a data set?
- How can you use a histogram to characterize the basic shape of a distribution?
- How can you use data to predict an event?
- How can you find a line that best models a data set?
- How can you read and make a two-way table?
- How can you display data in a way that helps you make decisions?

Student Learning Objectives:

- **MA.S-ID.A.1 - Students will be able to:** Represent data with plots on the real number line (dot plots, histograms, and box plots).
● Section 11.1, 11.2, 11.3, 11.5
- **MA.S-ID.A.2 Students will be able to:** Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.
● Section 11.3
- **MA.S-ID.A.3 Students will be able to:** Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).
● Section 11.1, 11.2, 11.3
- **MA.S-ID.A.5 Students will be able to:** 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.
● Section 11.4
- **MA.S-ID.A.6 Students will be able to:** Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.
- **MA.S-ID.A.6a. Students will be able to:** Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear and exponential models.
● Section 4.4, 4.5, 6.3, 9.2
- **MA.S-ID.A.6b. Students will be able to:** Informally assess the fit of a function by plotting and analyzing residuals.
● Section 4.5
- **MA.S-ID.A.6c. Students will be able to:** Fit a linear function for a scatter plot that suggests a linear association.

<ul style="list-style-type: none"> ● Section 4.4, 4.5 ● MA.S-ID.A.7 Students will be able to: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data. ● Section 4.4, 4.5 ● MA.S-ID.A.8 Students will be able to: Compute (using technology) and interpret the correlation coefficient of a linear fit. ● Section 4.5 ● MA.S-ID.A.9 Students will be able to: Distinguish between correlation and causation. ● Section 4.5 	
<p>Suggested Activities</p> <ul style="list-style-type: none"> ● Introduction videos ● ixl ● graphic organizers ● scavenger hunts ● flash cards ● My Dear Aunt Sally Game ● online questions correlated to textbook ● online textbook lesson ● Stem Videos 	<p>Instructional Materials/Resources</p> <ul style="list-style-type: none"> ● Big Ideas Math Textbook copyright 2022 ● Big Ideas record and practice journal ● Big Ideas resource by chapter workbook ● Big Ideas skills review handbook ● teacher made materials ● instructional videos ● quizzes ● online chapter review ● online practice test ● online test ● cumulative assessments ● benchmark tests ● performance assessment
<p>Pacing: approx # of class periods: 20</p>	

NJ Student Learning Standards for Math: MA.S-ID.A.1, MA.S-ID.A.2, MA.S-ID.A.3, MA.S-ID.B.5, MA.S-ID.B.6a, MA.S-ID.B.6b, MA.S-ID.B.6c, MA.S-ID.C.7, MA.S-ID.C.8, MA.S-ID.C.9

Interdisciplinary Connections

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Career Readiness-Personal Financial Literacy PFL.9.1.8.CDM.1, PFL.9.1.8.CDM.2, PFL.9.1.8.CDM.3., PFL.9.1.8.CP.1, PFL.9.1.8.CP.1, PFL.9.1.8.FI.4

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 Anchor Charts of Concepts
 Change in Content, Process, Product
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 Modified Class Assignments

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Assessments/assignments read orally w/ extended time Concept chunking Graphic organizer concept maps Picture study guides Small group instruction Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts	Extended time for assignments Frequent breaks Sign agenda book daily Study guides Graphic organizers
ELL	Gifted & Talented
Picture study guides Video presentation/Audio presentation Tests modified to include a word bank, drawings, and diagrams while still covering the essential concepts Spanish pupil editions including assessments	Independent extension research projects Jigsaw cooperative learning activities Student choice Advanced Activities Class grouping
At Risk/I&RS	At Risk/I&RS

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ixl math <https://www.ixl.com/>

prodigy <https://www.prodigygame.com/>

National Library of Virtual Manipulatives <http://nlvm.usu.edu/en/nav/vlibrary.html>

Internet4classrooms https://www.internet4classrooms.com/skills_6th.htm

Future Smart Financial Literacy <https://platform.everfi.net/teacher/curriculum/25/demo>

Junior Achievement <http://learn.ja.org>

Last Update: **July 2022**