Deal School Curriculum

Mathematics
Curriculum Guide
Grade 4

Deal School

Deal, New Jersey

2018
Board of Education

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Developed and Written

August – November 2014

Revised

December 2018

Board Approved

December 2018

Course Introduction

The *Envisions Math* program fully aligns with the national Common Core State Standards for Grade 4 Mathematics. The program is distinguished by its focus on real-life problem solving, balance between whole-class and self-directed learning, emphasis on communication, facilitation of school-family cooperation, and appropriate use of technology.

The projects, class games, and computer games are designed to help students to revisit skills learned and apply what they learned to real life situations.

Purpose

Our purpose is to have all of our students acquire the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

Assessments

Throughout the course students will demonstrate their knowledge daily during mental math and math message activities. Students will be assessed on daily quick checks, unit projects, written and self-assessments and open-ended response problems.

Deal School Curriculum
Grade 4 Mathematics – Geometry

Desired Outcomes	
Draw and identify lines and angles, and classify shapes by properties of their lines and angles. NJSLS.MATH.CONTENT.4.G.A.1 Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. Identify these in two-dimensional figures. NJSLS.MATH.CONTENT.4.G.A.2 Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size. Recognize right triangles as a category, and identify right triangles. NJSLS.MATH.CONTENT.4.G.A.3 Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.	
Enduring Understandings	**Essential Questions**
1. Two- and three-dimensional objects can be described, classified, and analyzed by their attributes. 2. An object in a plane or in space can be oriented in an infinite number of ways while maintaining its size or shape. 3. An object's location on a plane or in space can be described quantitatively. 4. Linear measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other	1. Why do we compare contrast and classify objects? 2. How do decomposing and recomposing shapes help us build our understanding of mathematics? 3. How can transformations be described mathematically?
Learners will know…	**Learners will be able to….**
● Drawing points, lines, line segments, rays, angles, and perpendicular and parallel lines forms two-dimensional figures. ● Two-dimensional figures are classified based on the presence or absence of parallel or perpendicular lines, or the presence or absence of angles of a specified size.	● Draw points, lines, line segments, rays, angles (right, acute, obtuse), and perpendicular and parallel lines. ● Identify these in two-dimensional figures. ● Classify two-dimensional figures based on the presence or absence of parallel or perpendicular lines, or the presence or absence of

● Some triangles are categorized as 'right triangles'. ● A line of symmetry for a two-dimensional figure is a line across the figure such that the figure can be folded along the line into matching parts.	angles of a specified size. ● Recognize right triangles as a category. ● Identify right triangles. ● Recognize a line of symmetry for a two-dimensional figure as a line across the figure such that the figure can be folded along the line into matching parts. Identify line-symmetric figures and draw lines of symmetry.

Assessment/Evaluation Evidence

Formative Assessments

Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
- Thumbs Up
- Exit Slips
- Think Pair Share
- Group Reporters
- Learning Logs
- Math Journals
- Turn and Talks

Student Self-Assessment
Graphic Organizers
Peer review
Class Discussion
Dry erase board assessment
Big Ideas Apply and Grow

Summative Assessments

Unit Assessments
Quizzes
Project specific Rubrics
Group Project Products

Benchmark Assessments

Big-Ideas Pre-Assessment
Big Ideas Post-Assessment
Big Ideas Course Benchmarks
LinkIt! Benchmark A
LinkIt! Benchmark B

LinkIt! Benchmark C

Alternative Assessments

Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

- Warm Up/ Dig In
- Explore and Grow
  - Direct instruction and modeling.
  - Partner practice and discovery.
- Think and Grow
  - Guided practice
  - Student conferences
  - Reteaching
- Apply and Grow - Independent Practice
- Think and Grow - Modeling Real Life
- Differentiated instruction and homework assignment.

Connect and Grow: Centers for reteaching and independent practice.
Assessments: Concept testing and performance tasks.

Suggested Learning Resources

Big Ideas Math Modeling Real Life - Teacher Resources

https://www.bigideasmath.com/BIM/login

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Smart Notebook

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.

Personal Financial Literacy

9.1.4.A.3 Explain how income affects spending and take-home pay.
9.1.4.B.2 Identify age-appropriate financial goals.
9.1.4.B.3 Explain what a budget is and why it is important.

Career Awareness Exploration and Preparation

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and

hands on materials.

Students with IEPs/504

- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:

- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
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Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening

Science Connection

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Projects

Place Value Project

Million Dollar Project
Movie Theater Design Project
Animal Measurement Project

Integration of Technology

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains 1 Adopted 10.1.14 the analysis of the data.

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

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Deal School Curriculum
Grade 4 Mathematics – Measurement and Data

Desired Outcomes

Solve problems involving measurement and conversion of measurements.

NJSLS.MATH.CONTENT.4.MD.A.1

Know relative sizes of measurement units within one system of units including km, m, cm; mm; kg, g; lb, oz.; l, ml; hr, min, sec. Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. Record measurement equivalents in a two-column table. For example, know that 1 ft is 12 times as long as 1 in. Express the length of a 4 ft snake as 48 in. Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ...

NJSLS.MATH.CONTENT.4.MD.A.2

Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

NJSLS.MATH.CONTENT.4.MD.A.3

Apply the area and perimeter formulas for rectangles in real world and mathematical problems. For example, find the width of a rectangular room given the area of the flooring and the length, by viewing the area formula as a multiplication equation with an unknown factor.

Represent and interpret data.

NJSLS.MATH.CONTENT.4.MD.B.4

Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Solve problems involving addition and subtraction of fractions by using information presented in line plots. For example, from a line plot find and interpret the difference in length between the longest and shortest specimens in an insect collection.

Geometric measurement: understand concepts of angle and measure angles.

NJSLS.MATH.CONTENT.4.MD.C.5

Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement:

NJSLS.MATH.CONTENT.4.MD.C.5.A

An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles.

NJSLS.MATH.CONTENT.4.MD.C.5.B

An angle that turns through n one-degree angles is said to have an angle measure of n degrees.
NJSLS.MATH.CONTENT.4.MD.C.6
Measure angles in whole-number degrees using a protractor. Sketch angles of specified measure.
NJSLS.MATH.CONTENT.4.MD.C.7
Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems, e.g., by using an equation with a symbol for the unknown angle measure.

Enduring Understandings	**Essential Questions**
1. Linear measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other.	1. How are measurement and counting related? 2. How does *what* we measure affect *how* we measure? 3. 3. How can space be defined through numbers/measurement?
Learners will know…	**Learners will be able to….**
● There are relative sizes of measurement in each measurement system. ● Larger units can be expressed in terms of a smaller unit. ● Addition, subtraction, multiplication, and division are used to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money. ● Diagrams may be used to represent measurement quantities. ● Line plots provide information for solving word problems. ● Angles are geometric shapes that are formed wherever two rays share a common endpoint. ● An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the	● Know relative sizes of measurement units within one system of units including km, m, cm; kg, g; lb, oz.; l, ml; hr, min, sec. ● Within a single system of measurement, express measurements in a larger unit in terms of a smaller unit. ● Record measurement equivalents in a two-column table. ● Generate a conversion table for feet and inches listing the number pairs (1, 12), (2, 24), (3, 36), ... ● Use the four operations to solve word problems involving distances, intervals of time, liquid volumes, masses of objects, and money, including problems involving simple fractions or decimals, and problems that require expressing measurements given in a larger unit in terms of a smaller unit. ● Represent measurement quantities using diagrams such as number line diagrams that feature a measurement scale.

circular arc between the points where the two rays intersect the circle. ● An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. ● A protractor is used to measure and sketch angles of specified measure. ● Angle measure is additive. ● When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. ●	● Apply the area and perimeter formulas for rectangles in real world and mathematical problems. ● Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). ● Solve problems involving addition and subtraction of fractions by using information presented in line plots. ● Recognize angles as geometric shapes that are formed wherever two rays share a common endpoint, and understand concepts of angle measurement: o An angle is measured with reference to a circle with its center at the common endpoint of the rays, by considering the fraction of the circular arc between the points where the two rays intersect the circle. o An angle that turns through 1/360 of a circle is called a "one-degree angle," and can be used to measure angles. ● Measure angles in whole-number degrees using a protractor. ● Sketch angles of specified measure. ● Recognize angle measure as additive. When an angle is decomposed into non-overlapping parts, the angle measure of the whole is the sum of the angle measures of the parts. ● Solve addition and subtraction problems to find unknown angles on a diagram in real world and mathematical problems.
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Deal School Curriculum
Grade 4 Mathematics –
Number and Operations - Fractions

Desired Outcomes

Extend understanding of fraction equivalence and ordering.

NJSLS.MATH.CONTENT.4.NF.A.1

Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions.

NJSLS.MATH.CONTENT.4.NF.A.2

Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model.

Build fractions from unit fractions.

NJSLS.MATH.CONTENT.4.NF.B.3

Understand a fraction a/b with a > 1 as a sum of fractions 1/b.

NJSLS.MATH.CONTENT.4.NF.B.3.A

Understand addition and subtraction of fractions as joining and separating parts referring to the same whole.

NJSLS.MATH.CONTENT.4.NF.B.3.B

Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. Examples: 3/8 = 1/8 + 1/8 + 1/8 ; 3/8 = 1/8 + 2/8 ; 2 1/8 = 1 + 1 + 1/8 = 8/8 + 8/8 + 1/8.

NJSLS.MATH.CONTENT.4.NF.B.3.C

Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction.

NJSLS.MATH.CONTENT.4.NF.B.3.D

Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem.

NJSLS.MATH.CONTENT.4.NF.B.4

Apply and extend previous understandings of multiplication to multiply a fraction by a whole number.

NJSLS.MATH.CONTENT.4.NF.B.4.A

Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction

model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4).
NJSLS.MATH.CONTENT.4.NF.B.4.B
Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.)
NJSLS.MATH.CONTENT.4.NF.B.4.C
Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem. For example, if each person at a party will eat 3/8 of a pound of roast beef, and there will be 5 people at the party, how many pounds of roast beef will be needed? Between what two whole numbers does your answer lie?

Understand decimal notation for fractions, and compare decimal fractions.

NJSLS.MATH.CONTENT.4.NF.C.5
Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100.2 For example, express 3/10 as 30/100, and add 3/10 + 4/100 = 34/100.
NJSLS.MATH.CONTENT.4.NF.C.6
Use decimal notation for fractions with denominators 10 or 100. For example, rewrite 0.62 as 62/100; describe a length as 0.62 meters; locate 0.62 on a number line diagram.
NJSLS.MATH.CONTENT.4.NF.C.7
Compare two decimals to hundredths by reasoning about their size. Recognize that comparisons are valid only when the two decimals refer to the same whole. Record the results of comparisons with the symbols >, =, or <, and justify the conclusions, e.g., by using a visual model.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be "undone" by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Equivalent fractions can be proven with the use of visual fraction models.	● Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models,

● This principle can be used to recognize and generate equivalent fractions. ● Although fractions have different numerators and denominators they can be equal. ● Comparison of fractions is possible only when the two fractions refer to the same whole. ● Fractions are compared using symbols >, =, or <. ● Addition and subtraction of fractions is joining and separating parts referring to the same whole. ● A fraction is decomposed into a sum of fractions with the same denominator in more than one way. ● Mixed numbers with like denominators can be added and subtracted. ● Fractions can be multiplied by whole numbers. ● a/b is a multiple of 1/b. ● Multiplication of fractions is a strategy used to solve word problems. ● A fraction with a denominator of 10 has an equivalent fraction with a denominator of 100. ● Such fractions can be expressed in decimal notation. ● Comparison strategies may be used when comparing fractions in decimal form. ● Such comparisons can be expressed using the symbols >, =, or <.	with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. ● Use this principle to recognize and generate equivalent fractions. ● Compare two fractions with different numerators and different denominators. ● Recognize that comparisons are valid only when the two fractions refer to the same whole. ● Record the results of comparisons with symbols >, =, or <, and justify the conclusions. ● Understand a fraction a/b with a > 1 as a sum of fractions 1/b. o Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. o Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. o Justify decompositions. o Add and subtract mixed numbers with like denominators. o Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators. ● Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. o Understand a fraction a/b as a multiple of 1/b. o Understand a multiple of a/b as a multiple of 1/b, and use

	this understanding to multiply a fraction by a whole number. ● Solve word problems involving multiplication of a fraction by a whole number. ● Express a fraction with denominator 10 as an equivalent fraction with denominator 100, and use this technique to add two fractions with respective denominators 10 and 100. ● Use decimal notation for fractions with denominators 10 or 100. ● Compare two decimals to hundredths by reasoning about their size. ● Recognize that comparisons are valid only when the two decimals refer to the same whole. ● Record the results of comparisons with the symbols >, =, or <, and justify the conclusions.

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- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:

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- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

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L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening

Science Connection

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Projects

Place Value Project
Million Dollar Project
Movie Theater Design Project
Animal Measurement Project

Integration of Technology

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains 1 Adopted 10.1.14 the analysis of the data.

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1adwqbuMKE1zgpZAnaKnnnZSkIvZwosCPacRif8Eu6x8/edit?usp=sharing

Deal School Curriculum
Grade 4 Mathematics –
Number and Operations in Base Ten

Desired Outcomes

Generalize place value understanding for multi-digit whole numbers.

NJSLS.MATH.CONTENT.4.NBT.A.1

Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. For example, recognize that 700 ÷ 70 = 10 by applying concepts of place value and division.

NJSLS.MATH.CONTENT.4.NBT.A.2

Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

NJSLS.MATH.CONTENT.4.NBT.A.3

Use place value understanding to round multi-digit whole numbers to any place.

Use place value understanding and properties of operations to perform multi-digit arithmetic.

NJSLS.MATH.CONTENT.4.NBT.B.4

Fluently add and subtract multi-digit whole numbers using the standard algorithm.

NJSLS.MATH.CONTENT.4.NBT.B.5

Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

NJSLS.MATH.CONTENT.4.NBT.B.6

Find whole-number quotients and remainders with up to four-digit dividends and one-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

Enduring Understandings	**Essential Questions**
1. Numbers can be represented in multiple ways. 2. The same operations can be applied in problem situations that seem quite different from another. 3. Being able to compute fluently means making smart choices about which tools to use and when to use them. 4. Knowing the reasonableness of an	1. What makes an estimate reasonable? 2. What makes an answer exact? 3. What makes a strategy both effective and efficient? 4. What makes a solution optimal?

answer comes from using good number sense and estimation strategies.	
Learners will know…	**Learners will be able to….**
● In a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. ● Multi-digit whole numbers can be written using base-ten numerals, number names, and expanded form. ● Two multi-digit numbers can be compared using >, =, and < symbols to record the results of comparisons. ● Multi-digit whole numbers can be compared using place value understanding to round to any place. ● Strategies based on place value and the properties of operations are used to multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers. ● Equations, rectangular arrays, and/or area models are used to illustrate and explain these calculations.	● Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right. ● Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form. ● Compare two multi-digit numbers based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. ● Use place value understanding to round multi-digit whole numbers to any place. ● Fluently add and subtract multi-digit whole numbers using the standard algorithm. ● Multiply a whole number of up to four digits by a one-digit whole number, and multiply two two-digit numbers, using strategies based on place value and the properties of operations. ● Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models
Assessment/Evaluation Evidence	
<u>Formative Assessments</u> Homework Checklist Assessments Center Products Writing Samples Pre-Assessments Thumbs Up Exit Slips Think Pair Share	

Group Reporters
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Mathematics will be taught for 90 minutes per day with a format that resembles:

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Warm-Ups
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Reteach
Enrichment and Extension
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Vocabulary Cards
Activities
Blackline Masters
Math Musicals
Virtual Manipulatives
Interactive Explorations
Digit Examples
Skills Trainer
Flashcards
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Game Library
Multi-language glossary
Graphic organizers
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Smart Notebook

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

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9.1.4.A.3 Explain how income affects spending and take-home pay.
9.1.4.B.2 Identify age-appropriate financial goals.
9.1.4.B.3 Explain what a budget is and why it is important.

Career Awareness Exploration and Preparation

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

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Deal School Curriculum
Grade 4 Mathematics – Operations and Algebraic Thinking

Desired Outcomes

Use the four operations with whole numbers to solve problems.

NJSLS.MATH.CONTENT.4.OA.A.1

Interpret a multiplication equation as a comparison, e.g., interpret 35 = 5 × 7 as a statement that 35 is 5 times as many as 7 and 7 times as many as 5. Represent verbal statements of multiplicative comparisons as multiplication equations.

NJSLS.MATH.CONTENT.4.OA.A.2

Multiply or divide to solve word problems involving multiplicative comparison, e.g., by using drawings and equations with a symbol for the unknown number to represent the problem, distinguishing multiplicative comparison from additive comparison.1

NJSLS.MATH.CONTENT.4.OA.A.3

Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. Represent these problems using equations with a letter standing for the unknown quantity. Assess the reasonableness of answers using mental computation and estimation strategies including rounding.

Gain familiarity with factors and multiples.

NJSLS.MATH.CONTENT.4.OA.B.4

Find all factor pairs for a whole number in the range 1-100. Recognize that a whole number is a multiple of each of its factors. Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. Determine whether a given whole number in the range 1-100 is prime or composite.

Generate and analyze patterns.

NJSLS.MATH.CONTENT.4.OA.C.5

Generate a number or shape pattern that follows a given rule. Identify apparent features of the pattern that were not explicit in the rule itself. For example, given the rule "Add 3" and the starting number 1, generate terms in the resulting sequence and observe that the terms appear to alternate between odd and even numbers. Explain informally why the numbers will continue to alternate in this way.

Enduring Understandings	Essential Questions
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be “undone” by its inverse.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?

4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	
Learners will know…	**Learners will be able to….**
● Addition, subtraction, multiplication, and division can be used to solve whole number problems. ● A multiplication equation is a comparison. ● Strategies including rounding can be used to assess the reasonableness of answers when using mental math. ● A whole number is a multiple of each of its factors. ● Whole numbers may be prime or composite. ● A prime number contains no factor pairs. ● Rules govern number or shape patterns.	● Interpret a multiplication equation as a comparison. ● Represent verbal statements of multiplicative comparisons as multiplication equations. ● Multiply or divide to solve word problems involving multiplicative comparison. ● Solve multistep word problems posed with whole numbers and having whole-number answers using the four operations, including problems in which remainders must be interpreted. ● Represent these problems using equations with a letter standing for the unknown quantity. ● Assess the reasonableness of answers using mental computation and estimation strategies including rounding. ● Find all factor pairs for a whole number in the range 1-100. ● Recognize that a whole number is a multiple of each of its factors. ● Determine whether a given whole number in the range 1-100 is a multiple of a given one-digit number. ● Determine whether a given whole number in the range 1-100 is prime or composite. ● Generate a number or shape pattern that follows a given rule. ● Identify apparent features of the pattern that were not explicit in the rule itself. ● Explain informally why the numbers will continue to alternate

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Assessment Evidence

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Annual Pacing Guide

Grade Level: 4th

Subject: Math

September	October	November	December	January
(8 days) Place Value Concepts	**(9 days)** Add and Subtract Multi-Digit Numbers **(15 days)** Multiply by One-Digit Numbers	**(15 days)** Multiply by One-Digit Numbers **(12 days)** Multiply by two-digit numbers	**(12 days)** Multiply by two-digit numbers **(13 days)** Divide Multi-Digit Numbers by One-Digit Numbers	**(13 days)** Divide Multi-Digit Numbers by One-Digi Numbers **(10 Days)** Factors, Multiples and Patterns

February	March	April	May	June
(10 Days) Factors, Multiples and Patterns **(10 Days)** Understand Fraction Equivalence and Comparison	**(13 days)** Add and Subtract Fractions **(9 days)** Multiply Whole Numbers and Fractions	**(11 days)** Relate Fractions and Decimals **(14 days)** Understand Measurement Equivalence	**(8 days)** Use Perimeter and Area Formulas **(12 days)** Identify and Draw lines and Angles	**(10 days)** Identify Symmetry and Two-Dimensional Shap

Working document.

Update as needed

Annual Pacing Guide

Grade Level: 4th

Subject: Math

Working document. Update as needed

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 5

Deal School

Deal, New Jersey

2018
Board of Education

Dennis Melofchik, President
Kaye Jannarone, Vice President

Michael Sorrentino
Donna Rienzo
David Tawil

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Consultant/Curriculum Development

Nick Montesano

Teacher(s)

Christina Robbins

Developed and Written

August – November 2014

Revised

December 2018

Board Approved

December 2018

Deal School

Deal, New Jersey

2017
Board of Education

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Teacher(s)

Christina Joyce

Developed and Written

August – November 2014

Board Approved

Course Introduction

The *Envisions Math* program fully aligns with the national Common Core State Standards for Grade 5 Mathematics. The program is distinguished by its focus on real-life problem solving, balance between whole-class and self-directed learning,

emphasis on communication, facilitation of school-family cooperation, and appropriate use of technology.

The projects, class games, and computer games are designed to help students to revisit skills learned and apply what they learned to real life situations.

Purpose

Our purpose is to have all of our students acquire the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

Assessments

Throughout the course students will demonstrate their knowledge daily during mental math and math message activities. Students will be assessed on daily quick checks, unit projects, written and self-assessments and open-ended response problems.

Deal School Curriculum
Grade 5 Mathematics –
Number and Operations in Base Ten

Desired Outcomes

Understand the place value system.

NJSLS.MATH.CONTENT.5.NBT.A.1

Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left.

NJSLS.MATH.CONTENT.5.NBT.A.2

Explain patterns in the number of zeros of the product when multiplying a number by powers of 10, and explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. Use whole-number exponents to denote powers of 10.

NJSLS.MATH.CONTENT.5.NBT.A.3

Read, write, and compare decimals to thousandths.

NJSLS.MATH.CONTENT.5.NBT.A.3.A

Read and write decimals to thousandths using base-ten numerals, number names, and expanded form, e.g., 347.392 = 3 × 100 + 4 × 10 + 7 × 1 + 3 × (1/10) + 9 × (1/100) + 2 × (1/1000).

NJSLS.MATH.CONTENT.5.NBT.A.3.B

Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons.

NJSLS.MATH.CONTENT.5.NBT.A.4

Use place value understanding to round decimals to any place.

Perform operations with multi-digit whole numbers and with decimals to hundredths.

NJSLS.MATH.CONTENT.5.NBT.B.5

Fluently multiply multi-digit whole numbers using the standard algorithm.

NJSLS.MATH.CONTENT.5.NBT.B.6

Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models.

NJSLS.MATH.CONTENT.5.NBT.B.7

Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

Enduring Understandings	Essential Questions

1. Numbers can be represented in multiple ways. 2. The same operations can be applied in problem situations that seem quite different from another. 3. Being able to compute fluently means making smart choices about which tools to use and when to use them. 4. Knowing the reasonableness of an answer comes from using good number sense and estimation strategies.	1. What makes an estimate reasonable? 2. What makes an answer exact? 3. What makes a strategy both effective and efficient? 4. What makes a solution optimal?
Learners will know…	**Learners will be able to….**
● In a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. ● Decimals are read and written to thousandths using base-ten numerals, number names, and expanded form. ● Rounding decimals is accomplished by using place value understanding. ● Standard algorithms are used to fluently multiply multi-digit whole numbers. ● Strategies based on place value, the properties of operations, and/or the relationship between multiplication and division are used to find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors. ● Concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction	● Recognize that in a multi-digit number, a digit in one place represents 10 times as much as it represents in the place to its right and 1/10 of what it represents in the place to its left. ● Explain patterns in the number of zeros of the product when multiplying a number by powers of 10. ● Explain patterns in the placement of the decimal point when a decimal is multiplied or divided by a power of 10. ● Use whole-number exponents to denote powers of 10. ● Read, write, and compare decimals to thousandths. o Read and write decimals to thousandths using base-ten numerals, number names, and expanded form. o Compare two decimals to thousandths based on meanings of the digits in each place, using >, =, and < symbols to record the results of comparisons. ● Use place value understanding to round decimals to any place. ● Fluently multiply multi-digit whole

● It is possible to add, subtract, multiply, and divide decimals to hundredths.	numbers using the standard algorithm. ● Find whole-number quotients of whole numbers with up to four-digit dividends and two-digit divisors, using strategies based on place value, the properties of operations, and/or the relationship between multiplication and division. Illustrate and explain the calculation by using equations, rectangular arrays, and/or area models. ● Add, subtract, multiply, and divide decimals to hundredths, using concrete models or drawings and strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.

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CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.
9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.\

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504

- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:

- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening

Science Connection

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Projects

Couponing project
Interpreting a menu project
Thanksgiving Dinner Project
Converting measurements (Elf or Giant) Project
Road Trip Project
Animal measurement Project
Coordinate Plane Map Project

Integration of Technology

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains 1 Adopted 10.1.14 the analysis of the data.

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1vd6CkkTw0nLBivO15QJUhk3HW6-6YWJLbTuw2UDaEQ8/edit?usp=sharing

Deal School Curriculum
Grade 5 Mathematics – Geometry

Desired Outcomes

Graph points on the coordinate plane to solve real-world and mathematical problems.

NJSLS.MATH.CONTENT.5.G.A.1

Use a pair of perpendicular number lines, called axes, to define a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond (e.g., x-axis and x-coordinate, y-axis and y-coordinate).

NJSLS.MATH.CONTENT.5.G.A.2

Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation.

Classify two-dimensional figures into categories based on their properties.

NJSLS.MATH.CONTENT.5.G.B.3

Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. For example, all rectangles have four right angles and squares are rectangles, so all squares have four right angles.

NJSLS.MATH.CONTENT.5.G.B.4

Classify two-dimensional figures in a hierarchy based on properties.

Enduring Understandings	**Essential Questions**
. Two- and three-dimensional objects can be described, classified, and analyzed by their attributes. 2. An object in a plane or in space can be oriented in an infinite number of ways while maintaining its size or shape. . An object's location on a plane or in space can be described quantitatively. . Linear measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other	1. Why do we compare contrast and classify objects? 2. How do decomposing and recomposing shapes help us build our understanding of mathematics? 3. How can transformations be described mathematically?
Learners will know…	**Learners will be able to….**
● A pair of perpendicular number lines, called axes, to define a	● Use a pair of perpendicular number lines, called axes, to define

coordinate system. ● In the coordinate system, the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. ● Real world and mathematical problems can be represented by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. ● Attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. ● Two-dimensional figures are classified in a hierarchy based on properties.	a coordinate system, with the intersection of the lines (the origin) arranged to coincide with the 0 on each line and a given point in the plane located by using an ordered pair of numbers, called its coordinates. ● Understand that the first number indicates how far to travel from the origin in the direction of one axis, and the second number indicates how far to travel in the direction of the second axis, with the convention that the names of the two axes and the coordinates correspond. ● Represent real world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation. ● Understand that attributes belonging to a category of two-dimensional figures also belong to all subcategories of that category. ● Classify two-dimensional figures in a hierarchy based on properties.

Assessment/Evaluation Evidence

Formative Assessments

Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
- Thumbs Up
- Exit Slips
- Think Pair Share
- Group Reporters
- Learning Logs
- Math Journals
- Turn and Talks

Student Self-Assessment

Graphic Organizers
Peer review
Class Discussion
Dry erase board assessment
Big Ideas Apply and Grow

Summative Assessments
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Group Project Products

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Alternative Assessments
Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

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  - Direct instruction and modeling.
  - Partner practice and discovery.
- Think and Grow
  - Guided practice
  - Student conferences
  - Reteaching
- Apply and Grow - Independent Practice
- Think and Grow - Modeling Real Life
- Differentiated instruction and homework assignment.

Connect and Grow: Centers for reteaching and independent practice.
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Suggested Learning Resources

District

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https://www.bigideasmath.com/BIM/login

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Extra Practice
Reteach
Enrichment and Extension
Prerequisite Skills Practice
Pre and Post Course Assessments
Course Benchmark Assessments
Chapter Assessments
Vocabulary Cards
Activities
Blackline Masters
Math Musicals
Virtual Manipulatives
Interactive Explorations
Digit Examples
Skills Trainer
Flashcards
STEAM videos
Game Library
Multi-language glossary
Graphic organizers
Math Tool Paper
Dry Erase Boards
Smart Notebook

21st Century Life and Skills

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.

9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.

9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Accommodations and Modifications

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Deal School Curriculum
Grade 5 Mathematics – Measurement and Data

Desired Outcomes

Convert like measurement units within a given measurement system.

NJSLS.MATH.CONTENT.5.MD.A.1

Convert among different-sized standard measurement units within a given measurement system (e.g., convert 5 cm to 0.05 m), and use these conversions in solving multi-step, real world problems.

Represent and interpret data.

NJSLS.MATH.CONTENT.5.MD.B.2

Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). Use operations on fractions for this grade to solve problems involving information presented in line plots. For example, given different measurements of liquid in identical beakers, find the amount of liquid each beaker would contain if the total amount in all the beakers were redistributed equally.

Geometric measurement: understand concepts of volume.

NJSLS.MATH.CONTENT.5.MD.C.3

Recognize volume as an attribute of solid figures and understand concepts of volume measurement.

NJSLS.MATH.CONTENT.5.MD.C.3.A

A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume.

NJSLS.MATH.CONTENT.5.MD.C.3.B

A solid figure that can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units.

NJSLS.MATH.CONTENT.5.MD.C.4

Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and non-standard units.

NJSLS.MATH.CONTENT.5.MD.C.5

Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume.

NJSLS.MATH.CONTENT.5.MD.C.5.A

Find the volume of a right rectangular prism with whole-number side lengths by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. Represent threefold whole-number products as volumes, e.g., to represent the associative property of multiplication.

NJSLS.MATH.CONTENT.5.MD.C.5.B

Apply the formulas $V = l \times w \times h$ and $V = B \times h$ for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems.

NJSLS.MATH.CONTENT.5.MD.C.5.C

Recognize volume as additive. Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	
Enduring Understandings	**Essential Questions**
1. Linear measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other.	1. How are measurement and counting related? 2. How does *what* we measure affect *how* we measure? 3. 3. How can space be defined through numbers/measurement?
Learners will know…	**Learners will be able to….**
● Conversions among different-sized standard measurement units within a given measurement system can be used in solving multi-step, real world problems. ● Line plots are used to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). ● Operations on fractions are used to solve problems involving information presented in line plots. ● Volume is an attribute of solid figures. ● A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. ● A solid figure that can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. ● Volumes can be measured by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. ● The operations of multiplication and addition can be used solve real world and mathematical problems	● Convert among different-sized standard measurement units within a given measurement system and use these conversions in solving multi-step, real world problems. ● Make a line plot to display a data set of measurements in fractions of a unit (1/2, 1/4, 1/8). ● Use operations on fractions for this grade to solve problems involving information presented in line plots. ● Recognize volume as an attribute of solid figures and understand concepts of volume measurement. o A cube with side length 1 unit, called a "unit cube," is said to have "one cubic unit" of volume, and can be used to measure volume. o A solid figure that can be packed without gaps or overlaps using n unit cubes is said to have a volume of n cubic units. ● Measure volumes by counting unit cubes, using cubic cm, cubic in, cubic ft, and improvised units. ● Relate volume to the operations of multiplication and addition and solve real world and mathematical problems involving volume. o Find the volume of a right rectangular prism with whole-number side lengths

involving volume. ● Volume is additive. ● The volume of a right rectangular prism with whole-number side lengths is found by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. ● Threefold whole number products are represented as volumes. ● The formulas V = l × w × h and V = b × h for rectangular prisms are applied to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. ● The volumes of solid figures composed of two non-overlapping right rectangular prisms are found by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.	by packing it with unit cubes, and show that the volume is the same as would be found by multiplying the edge lengths, equivalently by multiplying the height by the area of the base. o Represent threefold whole-number product as volumes. o Apply the formulas V = l × w × h and V = b × h for rectangular prisms to find volumes of right rectangular prisms with whole-number edge lengths in the context of solving real world and mathematical problems. ● Recognize volume as additive. o Find volumes of solid figures composed of two non-overlapping right rectangular prisms by adding the volumes of the non-overlapping parts, applying this technique to solve real world problems.

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Deal School Curriculum
Grade 5 Mathematics –
Number and Operations - Fractions

Desired Outcomes

Use equivalent fractions as a strategy to add and subtract fractions.

NJSLS.MATH.CONTENT.5.NF.A.1

Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. For example, 2/3 + 5/4 = 8/12 + 15/12 = 23/12. (In general, a/b + c/d = (ad + bc)/bd.)

NJSLS.MATH.CONTENT.5.NF.A.2

Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators, e.g., by using visual fraction models or equations to represent the problem. Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. For example, recognize an incorrect result 2/5 + 1/2 = 3/7, by observing that 3/7 < 1/2.

Apply and extend previous understandings of multiplication and division.

NJSLS.MATH.CONTENT.5.NF.B.3

Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, e.g., by using visual fraction models or equations to represent the problem. For example, interpret 3/4 as the result of dividing 3 by 4, noting that 3/4 multiplied by 4 equals 3, and that when 3 wholes are shared equally among 4 people each person has a share of size 3/4. If 9 people want to share a 50-pound sack of rice equally by weight, how many pounds of rice should each person get? Between what two whole numbers does your answer lie?

NJSLS.MATH.CONTENT.5.NF.B.4

Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction.

NJSLS.MATH.CONTENT.5.NF.B.4.A

Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. For example, use a visual fraction model to show (2/3) × 4 = 8/3, and create a story context for this equation. Do the same with (2/3) × (4/5) = 8/15. (In general, (a/b) × (c/d) = ac/bd.)

NJSLS.MATH.CONTENT.5.NF.B.4.B

Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. Multiply fractional side lengths to find areas of rectangles, and represent fraction products as rectangular areas.

NJSLS.MATH.CONTENT.5.NF.B.5

Interpret multiplication as scaling (resizing), by:
NJSLS.MATH.CONTENT.5.NF.B.5.A
Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication.
NJSLS.MATH.CONTENT.5.NF.B.5.B
Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number (recognizing multiplication by whole numbers greater than 1 as a familiar case); explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number; and relating the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1.
NJSLS.MATH.CONTENT.5.NF.B.6
Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
NJSLS.MATH.CONTENT.5.NF.B.7
Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions.1
NJSLS.MATH.CONTENT.5.NF.B.7.A
Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. For example, create a story context for $(1/3) \div 4$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $(1/3) \div 4 = 1/12$ because $(1/12) \times 4 = 1/3$.
NJSLS.MATH.CONTENT.5.NF.B.7.B
Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. Use the relationship between multiplication and division to explain that $4 \div (1/5) = 20$ because $20 \times (1/5) = 4$.
NJSLS.MATH.CONTENT.5.NF.B.7.C
Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions, e.g., by using visual fraction models and equations to represent the problem. For example, how much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 1/3-cup servings are in 2 cups of raisins?

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be "undone" by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?

found.	
Learners will know…	**Learners will be able to….**
● To add and subtract fractions with unlike denominators (including mixed numbers) replace given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. ● Benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. ● A fraction is interpreted as the division of the numerator by the denominator (a/b = a ÷ b). ● Fractions and whole numbers may be multiplied by a fraction. ● The product (a/b) × q is interpreted as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. ● The area of a rectangle with fractional side lengths is found by tiling it with unit squares of the appropriate unit fraction side lengths, and show that the area is the same as would be found by multiplying the side lengths. ● Multiplication can be interpreted by resizing. ● Multiplying a given number by a fraction greater than 1 results in a product greater than the given number. ● Multiplying a given number by a fraction less than 1 results in a product smaller than the given number. ● Multiplying a given number by	● Add and subtract fractions with unlike denominators (including mixed numbers) by replacing given fractions with equivalent fractions in such a way as to produce an equivalent sum or difference of fractions with like denominators. ● Solve word problems involving addition and subtraction of fractions referring to the same whole, including cases of unlike denominators. ● Use benchmark fractions and number sense of fractions to estimate mentally and assess the reasonableness of answers. ● Interpret a fraction as division of the numerator by the denominator (a/b = a ÷ b). ● Solve word problems involving division of whole numbers leading to answers in the form of fractions or mixed numbers, ● Apply and extend previous understandings of multiplication to multiply a fraction or whole number by a fraction. o Interpret the product (a/b) × q as a parts of a partition of q into b equal parts; equivalently, as the result of a sequence of operations a × q ÷ b. o Find the area of a rectangle with fractional side lengths by tiling it with unit squares of the appropriate unit fraction side lengths. o Show that the area is the same as would be found by multiplying the side lengths. o Multiply fractional side lengths to find areas of

a fraction less than 1 results in a product smaller than the given number. ● Multiplication of fractions and mixed numbers is a strategy useful in solving real world problems. ● It is possible to divide unit fractions by whole numbers and whole numbers by unit fractions. ● Division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions is a strategy used to solve real world problems.	rectangles. o Represent fraction products as rectangular areas. ● Interpret multiplication as scaling (resizing), by: o Comparing the size of a product to the size of one factor on the basis of the size of the other factor, without performing the indicated multiplication. o Explaining why multiplying a given number by a fraction greater than 1 results in a product greater than the given number o Explaining why multiplying a given number by a fraction less than 1 results in a product smaller than the given number. o Relate the principle of fraction equivalence $a/b = (n \times a)/(n \times b)$ to the effect of multiplying a/b by 1. ● Solve real world problems involving multiplication of fractions and mixed numbers. ● Apply and extend previous understandings of division to divide unit fractions by whole numbers and whole numbers by unit fractions. o Interpret division of a unit fraction by a non-zero whole number, and compute such quotients. o Interpret division of a whole number by a unit fraction, and compute such quotients. For example, create a story context for $4 \div (1/5)$, and use a visual fraction model to show the quotient. o Use the relationship

	between multiplication and division to explain that 4 ÷ (1/5) = 20 because 20 × (1/5) = 4. o Solve real world problems involving division of unit fractions by non-zero whole numbers and division of whole numbers by unit fractions.

Assessment/Evaluation Evidence

Formative Assessments

Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
- Thumbs Up
- Exit Slips
- Think Pair Share
- Group Reporters
- Learning Logs
- Math Journals
- Turn and Talks

Student Self-Assessment
Graphic Organizers
Peer review
Class Discussion
Dry erase board assessment
Big Ideas Apply and Grow

Summative Assessments

Unit Assessments
Quizzes
Project specific Rubrics
Group Project Products

Benchmark Assessments

Big-Ideas Pre-Assessment
Big Ideas Post-Assessment
Big Ideas Course Benchmarks
LinkIt! Benchmark A
LinkIt! Benchmark B
LinkIt! Benchmark C

Alternative Assessments

Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

- Warm Up/ Dig In
- Explore and Grow
    - Direct instruction and modeling.
    - Partner practice and discovery.
- Think and Grow
    - Guided practice
    - Student conferences
    - Reteaching
- Apply and Grow - Independent Practice
- Think and Grow - Modeling Real Life
- Differentiated instruction and homework assignment.

Connect and Grow: Centers for reteaching and independent practice.
Assessments: Concept testing and performance tasks.

Suggested Learning Resources

Big Ideas Math Modeling Real Life - Teacher Resources

https://www.bigideasmath.com/BIM/login

Big Ideas Math Manipulative Kit
Student Edition
Teaching Edition
Family Letters
Warm-Ups
Extra Practice
Reteach
Enrichment and Extension
Prerequisite Skills Practice
Pre and Post Course Assessments
Course Benchmark Assessments
Chapter Assessments
Vocabulary Cards
Activities

Blackline Masters
Math Musicals
Virtual Manipulatives
Interactive Explorations
Digit Examples
Skills Trainer
Flashcards
STEAM videos
Game Library
Multi-language glossary
Graphic organizers
Math Tool Paper
Dry Erase Boards
Smart Notebook

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.
9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.4.A.4 Explain why knowledge and skills acquired in the elementary grades lay the foundation for future academic and career success.

Accommodations and Modifications

Gifted and Talented
- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners
- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504
- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments

as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:
- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words

NJSLSA.W2. Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content

NJSLSA.W6. Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others

NJSLSA.W7. Conduct short as well as more sustained research projects, utilizing an inquiry-based research process, based on focused questions, demonstrating understanding of the subject under investigation.

L.4.3. Use knowledge of language and its conventions when writing, speaking, reading, or listening

Science Connection

3-5-ETS1-1 Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2 Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

Projects

Couponing project
Interpreting a menu project
Thanksgiving Dinner Project
Converting measurements (Elf or Giant) Project
Road Trip Project

Animal measurement Project
Coordinate Plane Map Project

Integration of Technology

8.1.5.A.1 Select and use the appropriate digital tools and resources to accomplish a variety of tasks including solving problems

8.1.5.A.3 Use a graphic organizer to organize information about problem or issue.

8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains 1 Adopted 10.1.14 the analysis of the data.

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1vd6CkkTw0nLBivO15QJUhk3HW6-6YWJLbTuw2UDaEQ8/edit?usp=sharing

Deal School Curriculum
Grade 5 Mathematics – Operations and Algebraic Thinking

Desired Outcomes

Write and interpret numerical expressions.

NJSLS.MATH.CONTENT.5.OA.A.1

Use parentheses, brackets, or braces in numerical expressions, and evaluate expressions with these symbols.

NJSLS.MATH.CONTENT.5.OA.A.2

Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. For example, express the calculation "add 8 and 7, then multiply by 2" as 2 × (8 + 7). Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product.

Analyze patterns and relationships.

NJSLS.MATH.CONTENT.5.OA.B.3

Generate two numerical patterns using two given rules. Identify apparent relationships between corresponding terms. Form ordered pairs consisting of corresponding terms from the two patterns, and graph the ordered pairs on a coordinate plane. For example, given the rule "Add 3" and the starting number 0, and given the rule "Add 6" and the starting number 0, generate terms in the resulting sequences, and observe that the terms in one sequence are twice the corresponding terms in the other sequence. Explain informally why this is so.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be “undone” by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Parentheses, brackets, or braces are used in numerical expressions. ● Parentheses, brackets, or braces	● Use parentheses, brackets, or braces in numerical expressions. ● Evaluate expressions with these symbols.

are used in numerical expressions. ● Numerical rules govern the formations of numerical patterns. ● Ordered pairs may be graphed on a coordinate plane.	● Write simple expressions that record calculations with numbers, and interpret numerical expressions without evaluating them. ● Recognize that 3 × (18932 + 921) is three times as large as 18932 + 921, without having to calculate the indicated sum or product. ● Generate two numerical patterns using two given rules. ● Identify apparent relationships between corresponding terms. ● Form ordered pairs consisting of corresponding terms from the two patterns. ● Graph the ordered pairs on a coordinate plane.

Assessment/Evaluation Evidence

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Digit Examples
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21st Century Life and Careers

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8.1.5.A.4 Graph data using a spreadsheet, analyze and produce a report that explains 1 Adopted 10.1.14 the analysis of the data.

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1vd6CkkTw0nLBivO15QJUhk3HW6-6YWJLbTuw2UDaEQ8/edit?usp=sharing

Annual Pacing Guide

Grade Level: 5th

Subject: Math

September	October	November	December	January
(11 days) Place Value Concepts	**(8 days)** Numerical Expressions **(12 days)** Add and Subtract Decimals	**(12 days)** Add and Subtract Decimals **(9 days)** Multiply Whole Numbers	**(9 days)** Multiply Whole Numbers **(13 days)** Multiply Decimals	**(13 days)** Multiply Decimals **(13 Days)** Divide Whole Number

February	March	April	May	June
(13 Days) Divide Whole Numbers **(14 Days)** Divide Decimals	**(12 days)** Add and Subtract Fractions **(12 days)** Multiply Fractions	**(9 days)** Relate Fractions and Decimals **(12 days)** Understand Measurement Equivalence	**(11 days)** Patterns in the Coordinate Plane **(9 days)** Understand Volume	**(8 days)** Classify Two-Dimensional Shapes

Working document.

Update as needed

Annual Pacing Guide

Grade Level: 5th

Subject: Math

Working document. Update as needed

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 6

Deal School

Deal, New Jersey

2018
Board of Education

Dennis Melofchik, President
Kaye Jannarone, Vice President

Michael Sorrentino
Donna Rienzo
David Tawil

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Consultant/Curriculum Development

Nick Montesano

Teacher(s)

Christina Robbins
Bill Martin

Developed and Written

August – November 2014

Revised

December 2018

Board Approved

December 2018

Course Introduction

The *Digits Math* program fully aligns with the national Common Core State Standards for Grade 6 Mathematics. The program is distinguished by its focus on real-life problem solving, balance between whole-class and self-directed learning, emphasis on communication, facilitation of school-family cooperation, and appropriate use of technology.

The projects, class games, and computer games are designed for students to revisit skills learned and apply what they learned to real life situations.

Purpose

Our purpose is to have all of our students acquire the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

Assessments

Throughout the course students will demonstrate their knowledge daily during mental math and math message activities. Students will be assessed on daily quick checks, unit projects, written and self-assessments and open-ended response problems.

Deal School Curriculum
Grade 6 Mathematics – Statistics and Probability

Desired Outcomes

Develop understanding of statistical variability.

NJSLS.MATH.CONTENT.6.SP.A.1

Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. For example, "How old am I?" is not a statistical question, but "How old are the students in my school?" is a statistical question because one anticipates variability in students' ages.

NJSLS.MATH.CONTENT.6.SP.A.2

Understand that a set of data collected to answer a statistical question has a distribution, which can be described by its center, spread, and overall shape.

NJSLS.MATH.CONTENT.6.SP.A.3

Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number.

Summarize and describe distributions.

NJSLS.MATH.CONTENT.6.SP.B.4

Display numerical data in plots on a number line, including dot plots, histograms, and box plots.

NJSLS.MATH.CONTENT.6.SP.B.5

Summarize numerical data sets in relation to their context, such as by:

NJSLS.MATH.CONTENT.6.SP.B.5.A

Reporting the number of observations.

NJSLS.MATH.CONTENT.6.SP.B.5.B

Describing the nature of the attribute under investigation, including how it was measured and its units of measurement.

NJSLS.MATH.CONTENT.6.SP.B.5.C

Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

NJSLS.MATH.CONTENT.6.SP.B.5.D

Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Enduring Understandings	Essential Questions
1. The question to be answered determines the data to be collected and how best to collect it.	1. What is average? 2. What makes a data representation useful? 3. How does my sample affect confidence in my predication?

2. Basic statistical techniques can be used to analyze data in the workplace. 3. The probability of an event can be used to predict the probability of future events.	4. What is fair?
Learners will know…	**Learners will be able to….**
● A statistical question is one that anticipates variability in the data related to the question and accounts for it in the answers. ● A set of data is collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape. ● A measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. ● Numerical data is displayed in plots on a number line, including dot plots, histograms, and box plots. ● Numerical data sets are displayed in relation to their context.	● Recognize a statistical question as one that anticipates variability in the data related to the question and accounts for it in the answers. ● Understand that a set of data collected to answer a statistical question has a distribution that can be described by its center, spread, and overall shape. ● Recognize that a measure of center for a numerical data set summarizes all of its values with a single number, while a measure of variation describes how its values vary with a single number. ● Display numerical data in plots on a number line, including dot plots, histograms, and box plots. ● Summarize numerical data sets in relation to their context, such as by: o Reporting the number of observations. o Describing the nature of the attribute under investigation, including how it was measured and its units of measurement. o Giving quantitative measures of center and variability, as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data were gathered.

	o Relating the choice of measures of center and variability to the shape of the data distribution and the context in which the data were gathered.

Assessment/Evaluation Evidence

Formative Assessments
Homework
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Alternative Assessments

Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

- Warm Up
- Exploration
    - Direct instruction and modeling.
    - Partner practice and discovery.
- Examples and Try It
    - Guided practice
    - Student conferences
    - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

District	Other
• Big Ideas Math Modeling Real Life - Teacher Resources • • https://www.bigideasmath.com/BIM/login • • Big Ideas Math Manipulative Kit • Student Edition • Teaching Edition • Family Letters • Warm-Ups • Extra Practice • Reteach • Enrichment and Extension • Puzzle Time • Prerequisite Skills Practice • Pre and Post Course Assessments • Course Benchmark Assessments	

- Alternative Assessments
- Chapter Assessments
- STEAM Performance Tasks
- Activities
- Blackline Masters
- Virtual Manipulatives
- Interactive Explorations
- Digit Examples
- Skills Trainer
- Mini-Assessments
- STEAM videos
- Game Library
- Multi-language glossary
- Cross-Curricular Projects
- Graphic organizers
- Math Tool Paper
- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities

What does a Mathematician look like?

10.2 Histogram

21st Century Life and Careers

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Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.

9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.

9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career

Career and Technical Education

9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504

- Review student individual educational plan and/or 504 plan
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- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats,

including visually and quantitatively, as well as in words.

Science Connection

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability]

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave

Integration of Technology

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1QoRrCV4tu6hmA4huZ70JJzSTNubLpepTkjM0St_Emao/edit?usp=sharing

Deal School Curriculum
Grade 6 Mathematics – Geometry

Desired Outcomes

Solve real-world and mathematical problems involving area, surface area, and volume.

NJSLS.MATH.CONTENT.6.G.A.1

Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes; apply these techniques in the context of solving real-world and mathematical problems.

NJSLS.MATH.CONTENT.6.G.A.2

Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. Apply the formulas V = l w h and V = B h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems.

NJSLS.MATH.CONTENT.6.G.A.3

Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.

NJSLS.MATH.CONTENT.6.G.A.4

Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. Apply these techniques in the context of solving real-world and mathematical problems.

Enduring Understandings	**Essential Questions**
›- and three-dimensional objects can be described, classified, and analyzed by their attributes. ›bject in a plane or in space can be oriented in an infinite number of ways while maintaining its size or shape. ›bject's location on a plane or in space can be described quantitatively. ɛar measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other.	1. Why do we compare contrast and classify objects? 2. How do decomposing and recomposing shapes help us build our understanding of mathematics? 3. How can transformations be described mathematically?

Learners will know…	**Learners will be able to….**
● The area of right triangles, other triangles, special quadrilaterals, and polygons is found by composing into rectangles or decomposing into triangles and other shapes. ● The volume of a right rectangular prism with fractional edge lengths can be found by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. ● The formulas V = l w h and V = b h are used to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. ● Polygons are drawn in the coordinate plane when given coordinates for the vertices. ● Coordinates are used to find the length of a side joining points with the same first coordinate or the same second coordinate. ● Nets made up of rectangles and triangles are used to represent three-dimensional figures and find the surface of these figures. ● All of these techniques may be used in the context of solving real-world and mathematical problems.	● Find the area of right triangles, other triangles, special quadrilaterals, and polygons by composing into rectangles or decomposing into triangles and other shapes. ● Apply these techniques in the context of solving real-world and mathematical problems. ● Find the volume of a right rectangular prism with fractional edge lengths by packing it with unit cubes of the appropriate unit fraction edge lengths, and show that the volume is the same as would be found by multiplying the edge lengths of the prism. ● Apply the formulas V = l w h and V = b h to find volumes of right rectangular prisms with fractional edge lengths in the context of solving real-world and mathematical problems. ● Draw polygons in the coordinate plane given coordinates for the vertices. ● Use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. ● Apply these techniques in the context of solving real-world and mathematical problems. ● Represent three-dimensional figures using nets made up of rectangles and triangles, and use the nets to find the surface area of these figures. ● Apply these techniques in the context of solving real-world and mathematical problems.
Assessment/Evaluation Evidence	

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- Warm Up

- Exploration
    - Direct instruction and modeling.
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- Examples and Try It
    - Guided practice
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Deal School Curriculum
Grade 6 Mathematics – The Number System

Desired Outcomes

Apply and extend previous understandings of multiplication and division to divide fractions by fractions.

NJSLS.MATH.CONTENT.6.NS.A.1

Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions, e.g., by using visual fraction models and equations to represent the problem. For example, create a story context for (2/3) ÷ (3/4) and use a visual fraction model to show the quotient; use the relationship between multiplication and division to explain that (2/3) ÷ (3/4) = 8/9 because 3/4 of 8/9 is 2/3. (In general, (a/b) ÷ (c/d) = ad/bc.) How much chocolate will each person get if 3 people share 1/2 lb of chocolate equally? How many 3/4-cup servings are in 2/3 of a cup of yogurt? How wide is a rectangular strip of land with length 3/4 mi and area 1/2 square mi?.

Compute fluently with multi-digit numbers and find common factors and multiples.

NJSLS.MATH.CONTENT.6.NS.B.2

Fluently divide multi-digit numbers using the standard algorithm.

NJSLS.MATH.CONTENT.6.NS.B.3

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

NJSLS.MATH.CONTENT.6.NS.B.4

Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. For example, express 36 + 8 as 4 (9 + 2).

Apply and extend previous understandings of numbers to the system of rational numbers.

NJSLS.MATH.CONTENT.6.NS.C.5

Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, credits/debits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation.

NJSLS.MATH.CONTENT.6.NS.C.6

Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates.

NJSLS.MATH.CONTENT.6.NS.C.6.A

Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite.
NJSLS.MATH.CONTENT.6.NS.C.6.B
Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes.
NJSLS.MATH.CONTENT.6.NS.C.6.C
Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane.
NJSLS.MATH.CONTENT.6.NS.C.7
Understand ordering and absolute value of rational numbers.
NJSLS.MATH.CONTENT.6.NS.C.7.A
Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. For example, interpret -3 > -7 as a statement that -3 is located to the right of -7 on a number line oriented from left to right.
NJSLS.MATH.CONTENT.6.NS.C.7.B
Write, interpret, and explain statements of order for rational numbers in real-world contexts. For example, write -3 oC > -7 oC to express the fact that -3 oC is warmer than -7 oC.
NJSLS.MATH.CONTENT.6.NS.C.7.C
Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. For example, for an account balance of -30 dollars, write |-30| = 30 to describe the size of the debt in dollars.
NJSLS.MATH.CONTENT.6.NS.C.7.D
Distinguish comparisons of absolute value from statements about order. For example, recognize that an account balance less than -30 dollars represents a debt greater than 30 dollars.
NJSLS.MATH.CONTENT.6.NS.C.8
Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

Enduring Understandings	**Essential Questions**
1. Numbers can be represented in multiple ways. 2. The same operations can be applied in problem situations that seem quite different from another. 3. Being able to compute fluently means making smart choices about which tools to use and when to use them. 4. Knowing the reasonableness of an answer comes from using good number sense and estimation strategies.	1. What makes an estimate reasonable? 2. What makes an answer exact? 3. What makes a strategy both effective and efficient? 4. What makes a solution optimal?

Learners will know…	**Learners will be able to….**
● The standard algorithm is used to fluently divide multi-digit numbers. ● The standard algorithm for each operation is used to fluently add, subtract, multiply, and divide multi-digit decimals. ● The distributive property is used to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. ● Positive and negative numbers are used together to describe quantities having opposite directions or values. ● A rational number as a point on the number line. ● To extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane use negative number coordinates. ● Opposite signs of numbers indicate locations on opposite sides of 0 on the number line. ● The opposite of the opposite of a number is the number itself. ● Signs of numbers in ordered pairs indicate locations in quadrants of the coordinate plane. ● When two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. ● Statements of inequality are interpreted as statements about the relative position of two numbers on a number line diagram. ● Graphing points in all four quadrants of the coordinate plane is a strategy used to solve real-world and mathematical problems.	● Interpret and compute quotients of fractions, and solve word problems involving division of fractions by fractions. ● Fluently divide multi-digit numbers using the standard algorithm. ● Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation. ● Find the greatest common factor of two whole numbers less than or equal to 100 and the least common multiple of two whole numbers less than or equal to 12. ● Use the distributive property to express a sum of two whole numbers 1-100 with a common factor as a multiple of a sum of two whole numbers with no common factor. ● Understand that positive and negative numbers are used together to describe quantities having opposite directions or values. ● Use positive and negative numbers to represent quantities

	in real-world contexts, explaining the meaning of 0 in each situation. ● Understand a rational number as a point on the number line. ● Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. o Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line. o Recognize that the opposite of the opposite of a number is the number itself. o Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane. o Recognize that when two ordered pairs differ only by signs, the locations of

	the points are related by reflections across one or both axes. o Find and position integers and other rational numbers on a horizontal or vertical number line diagram. o Find and position pairs of integers and other rational numbers on a coordinate plane. ● Understand ordering and absolute value of rational numbers. o Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. o Write, interpret, and explain statements of order for rational numbers in real-world contexts. o Distinguish comparisons

	of absolute value from statements about order. ● Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate.

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  - Partner practice and discovery.
- Examples and Try It
  - Guided practice
  - Student conferences
  - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

District	Other
• Big Ideas Math Modeling Real Life - Teacher Resources • • https://www.bigideasmath.com/BIM/login • • Big Ideas Math Manipulative Kit	

- Student Edition
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- Warm-Ups
- Extra Practice
- Reteach
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- Pre and Post Course Assessments
- Course Benchmark Assessments
- Alternative Assessments
- Chapter Assessments
- STEAM Performance Tasks
- Activities
- Blackline Masters
- Virtual Manipulatives
- Interactive Explorations
- Digit Examples
- Skills Trainer
- Mini-Assessments
- STEAM videos
- Game Library
- Multi-language glossary
- Cross-Curricular Projects
- Graphic organizers
- Math Tool Paper
- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities

What does a Mathematician look like?

21st Century Life and Careers

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Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.

CRP2. Apply appropriate academic and technical skills.

CRP4. Communicate clearly and effectively and with reason.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

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9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and

economic conditions affect income.
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9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career

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9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented
- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners
- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504
- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:
- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

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NJSLSA.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

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MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability]

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave

Integration of Technology

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1QoRrCV4tu6hmA4huZ70JJzSTNubLpepTkjM0St_Emao/edit?usp=sharing

Deal School Curriculum
Grade 6 Mathematics – Ratios & Proportional Relationships

Desired Outcomes

Understand ratio concepts and use ratio reasoning to solve problems.

NJSLS.MATH.CONTENT.6.RP.A.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. For example, "The ratio of wings to beaks in the bird house at the zoo was 2:1, because for every 2 wings there was 1 beak." "For every vote candidate A received, candidate C received nearly three votes."

NJSLS.MATH.CONTENT.6.RP.A.2

Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship. For example, "This recipe has a ratio of 3 cups of flour to 4 cups of sugar, so there is 3/4 cup of flour for each cup of sugar." "We paid $75 for 15 hamburgers, which is a rate of $5 per hamburger."1

NJSLS.MATH.CONTENT.6.RP.A.3

Use ratio and rate reasoning to solve real-world and mathematical problems, e.g., by reasoning about tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

NJSLS.MATH.CONTENT.6.RP.A.3.A

Make tables of equivalent ratios relating quantities with whole-number measurements, find missing values in the tables, and plot the pairs of values on the coordinate plane. Use tables to compare ratios.

NJSLS.MATH.CONTENT.6.RP.A.3.B

Solve unit rate problems including those involving unit pricing and constant speed. For example, if it took 7 hours to mow 4 lawns, then at that rate, how many lawns could be mowed in 35 hours? At what rate were lawns being mowed?

NJSLS.MATH.CONTENT.6.RP.A.3.C

Find a percent of a quantity as a rate per 100 (e.g., 30% of a quantity means 30/100 times the quantity); solve problems involving finding the whole, given a part and the percent.

NJSLS.MATH.CONTENT.6.RP.A.3.D

Use ratio reasoning to convert measurement units; manipulate and transform units appropriately when multiplying or dividing quantities.

Enduring Understandings	Essential Questions
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions?

3. An operation can be "undone" by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Ratio language to describe a ratio relationship between two quantities. ● Rate language is used in the context of a ratio relationship. ● Ratio and rate reasoning is used to solve real-world and mathematical problems. ● Tables of equivalent ratios are made relating quantities with whole-number measurements. ● Tables are used to compare ratios. ● Ratio reasoning is used to convert measurement units. ● Multiplying or dividing quantities helps to manipulate and transform units appropriately.	● Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities. ● Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$. ● Use rate language in the context of a ratio relationship. ● Use ratio and rate reasoning to solve real-world and mathematical problems. o Make tables of equivalent ratios relating quantities with whole-number measurements. o Find missing values in the tables, and plot the pairs of values on the coordinate plane. o Use tables to compare ratios. o Solve unit rate problems including those involving unit pricing and constant speed. o Find a percent of a quantity as a rate per 100. o Solve problems involving finding the whole, given a part and the percent. o Use ratio reasoning to convert measurement units. o Manipulate and transform units appropriately when

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8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1QoRrCV4tu6hmA4huZ70JJzSTNubLpepTkjM0St_Emao/edit?usp=sharing

Deal School Curriculum
Grade 6 Mathematics – Expressions and Equations

Desired Outcomes

Apply and extend previous understandings of arithmetic to algebraic expressions.

NJSLS.MATH.CONTENT.6.EE.A.1

Write and evaluate numerical expressions involving whole-number exponents.

NJSLS.MATH.CONTENT.6.EE.A.2

Write, read, and evaluate expressions in which letters stand for numbers.

NJSLS.MATH.CONTENT.6.EE.A.2.A

Write expressions that record operations with numbers and with letters standing for numbers. For example, express the calculation "Subtract y from 5" as 5 - y.

NJSLS.MATH.CONTENT.6.EE.A.2.B

Identify parts of an expression using mathematical terms (sum, term, product, factor, quotient, coefficient); view one or more parts of an expression as a single entity. For example, describe the expression 2 (8 + 7) as a product of two factors; view (8 + 7) as both a single entity and a sum of two terms.

NJSLS.MATH.CONTENT.6.EE.A.2.C

Evaluate expressions at specific values of their variables. Include expressions that arise from formulas used in real-world problems. Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). For example, use the formulas V = s3 and A = 6 s2 to find the volume and surface area of a cube with sides of length s = 1/2.

NJSLS.MATH.CONTENT.6.EE.A.3

Apply the properties of operations to generate equivalent expressions. For example, apply the distributive property to the expression 3 (2 + x) to produce the equivalent expression 6 + 3x; apply the distributive property to the expression 24x + 18y to produce the equivalent expression 6 (4x + 3y); apply properties of operations to y + y + y to produce the equivalent expression 3y.

NJSLS.MATH.CONTENT.6.EE.A.4

Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). For example, the expressions y + y + y and 3y are equivalent because they name the same number regardless of which number y stands for.

Reason about and solve one-variable equations and inequalities.

NJSLS.MATH.CONTENT.6.EE.B.5

Understand solving an equation or inequality as a process of answering a question: which values from a specified set, if any, make the equation or inequality true? Use substitution to determine whether a given number in a specified set makes an equation or inequality true.

NJSLS.MATH.CONTENT.6.EE.B.6
Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set.
NJSLS.MATH.CONTENT.6.EE.B.7
Solve real-world and mathematical problems by writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers.
NJSLS.MATH.CONTENT.6.EE.B.8
Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form x > c or x < c have infinitely many solutions; represent solutions of such inequalities on number line d**iagrams.**
Represent and analyze quantitative relationships between dependent and independent variables.
NJSLS.MATH.CONTENT.6.EE.C.9
Use variables to represent two quantities in a real-world problem that change in relationship to one another; write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation. For example, in a problem involving motion at constant speed, list and graph ordered pairs of distances and times, and write the equation d = 65t to represent the relationship between distance and time.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be “undone” by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Expressions that record operations are written with numbers and with letters standing for numbers. ● Mathematical terms are used to identify parts of an expression.	● Write and evaluate numerical expressions involving whole-number exponents. ● Write, read, and evaluate expressions in which letters stand for numbers.

● Expressions are evaluated at specific values of their variables. ● Grade 6 students are able to perform arithmetic operations. ● The properties of operations are applied to generate equivalent expressions. ● Solving an equation or inequality is a process of answering a question. ● Substitution is used to determine whether a given number in a specified set makes an equation or inequality true. ● Variables are used to represent numbers and write expressions when solving a real-world or mathematical problem. ● A variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. ● Writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers is a strategy to solve real-world and mathematical problems. ● An inequality of the form x > c or x < c is used to represent a constraint or condition in a real-world or mathematical problem. ● Inequalities of the form x > c or x < c have infinitely many solutions. ● Such inequalities can be represented on a number line. ● Variables are used to represent two quantities in a real-world problem that change in relationship to one another. ● Equations are written to express one quantity, thought of as the dependent variable, in terms of	o Write expressions that record operations with numbers and with letters standing for numbers. o Identify parts of an expression using mathematical terms. o View one or more parts of an expression as a single entity. o Evaluate expressions at specific values of their variables. o Perform arithmetic operations, including those involving whole-number exponents, in the conventional order when there are no parentheses to specify a particular order (Order of Operations). ● Apply the properties of operations to generate equivalent expressions. ● Identify when two expressions are equivalent ● Understand solving an equation or inequality as a process of answering a question. ● Use substitution to determine whether a given number in a specified set makes an equation or inequality true. ● Use variables to represent numbers and write expressions when solving a real-world or mathematical problem. ● Understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. ● Solve real-world and mathematical problems by

the other quantity, thought of as the independent variable. ● The relationship between the dependent and independent variables can be analyzed using graphs and tables, and relate these to the equation.	writing and solving equations of the form x + p = q and px = q for cases in which p, q and x are all nonnegative rational numbers. ● Write an inequality of the form x > c or x < c to represent a constraint or condition in a real-world or mathematical problem. ● Recognize that inequalities of the form x > c or x < c have infinitely many solutions. ● Represent solutions of such inequalities on number line diagrams. ● Use variables to represent two quantities in a real-world problem that change in relationship to one another. ● Write an equation to express one quantity, thought of as the dependent variable, in terms of the other quantity, thought of as the independent variable. ● Analyze the relationship between the dependent and independent variables using graphs and tables, and relate these to the equation.

Assessment/Evaluation Evidence

Formative Assessments

Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
Thumbs Up
Exit Slips
Think Pair Share
Group Reporters
Learning Logs
Math Journals
Turn and Talks
Student Self-Assessment

Graphic Organizers
Peer review
Class Discussion
Dry erase board assessment
Big Ideas Apply and Grow

Summative Assessments
Unit Assessments
Alternative Assessments
Quizzes
Project specific Rubrics
Group Project Products

Benchmark Assessments
Big-Ideas Pre-Assessment
Big Ideas Post-Assessment
Big Ideas Course Benchmarks
LinkIt! Benchmark A
LinkIt! Benchmark B
LinkIt! Benchmark C

Alternative Assessments
Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

- Warm Up
- Exploration
    - Direct instruction and modeling.
    - Partner practice and discovery.
- Examples and Try It
    - Guided practice
    - Student conferences
    - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

Big Ideas Math Modeling Real Life - Teacher Resources

https://www.bigideasmath.com/BIM/login

Big Ideas Math Manipulative Kit
Student Edition
Teaching Edition
Family Letters
Warm-Ups
Extra Practice
Reteach
Enrichment and Extension
Puzzle Time
Prerequisite Skills Practice
Pre and Post Course Assessments
Course Benchmark Assessments
Alternative Assessments
Chapter Assessments
STEAM Performance Tasks
Activities
Blackline Masters
Virtual Manipulatives
Interactive Explorations
Digit Examples
Skills Trainer
Mini-Assessments
STEAM videos
Game Library
Multi-language glossary
Cross-Curricular Projects
Graphic organizers
Math Tool Paper
Dry Erase Boards
Smart Notebook

LGBTQ+ and Disabilities
What does a Mathematician look like?

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.
9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career

Career and Technical Education

9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504

- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:

- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction

- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

Literacy Connection

NJSLSA.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLSA.R1. Read closely to determine what the text says explicitly and to make logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Science Connection

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability]

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave

Integration of Technology

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide
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Annual Pacing Guide

Grade Level: 6

Subject: Math

September	October	November	December	January
umber System	Number System Expressions and Equations	Expressions and Equations	Expressions and Equations	Functions

February	March	April	May	June
tios and Proportional lationships	Ratios and Proportional Relationships	Geometry	Geometry	Statistics and Probability

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 7

Deal School

Deal, New Jersey

2018
Board of Education

Dennis Melofchik, President
Kaye Jannarone, Vice President

Michael Sorrentino
Donna Rienzo
David Tawil

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Consultant/Curriculum Development

Nick Montesano

Teacher(s)

Christina Robbins
Bill Martin

Developed and Written

August – November 2014

Revised

December 2018

Board Approved

December 2018

Course Introduction

The *Digits Math* program fully aligns with the national Common Core State Standards for Grade 7 Mathematics. The program is distinguished by its focus on real-life problem solving, balance between whole-class and self-directed learning, emphasis on communication, facilitation of school-family cooperation, and appropriate use of technology.

The projects, class games, and computer games are designed for students to revisit skills learned and apply what they learned to real life situations.

Purpose

Our purpose is to have all of our students acquire the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

Assessments

Throughout the course students will demonstrate their knowledge daily during mental math and math message activities. Students will be assessed on daily quick checks, unit projects, written and self-assessments and open-ended response problems.

Deal School Curriculum
Grade 7 Mathematics – The Number System

Desired Outcomes

Apply and extend previous understandings of operations with fractions.

NJSLS.MATH.CONTENT.7.NS.A.1

Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers; represent addition and subtraction on a horizontal or vertical number line diagram.

NJSLS.MATH.CONTENT.7.NS.A.1.A

Describe situations in which opposite quantities combine to make 0. For example, a hydrogen atom has 0 charge because its two constituents are oppositely charged.For example,in the first round of a game,she lost 20 points.what is her score at the end of the second round?

NJSLS.MATH.CONTENT.7.NS.A.1.B

Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts.

NJSLS.MATH.CONTENT.7.NS.A.1.C

Understand subtraction of rational numbers as adding the additive inverse, p - q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts.

NJSLS.MATH.CONTENT.7.NS.A.1.D

Apply properties of operations as strategies to add and subtract rational numbers.

NJSLS.MATH.CONTENT.7.NS.A.2

Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers.

NJSLS.MATH.CONTENT.7.NS.A.2.A

Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts.

NJSLS.MATH.CONTENT.7.NS.A.2.B

Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (-p)/q = p/(-q). Interpret quotients of rational numbers by describing real-world contexts.

NJSLS.MATH.CONTENT.7.NS.A.2.C

Apply properties of operations as strategies to multiply and divide rational numbers.

NJSLS.MATH.CONTENT.7.NS.A.2.D

Convert a rational number to a decimal using long division; know that the decimal form of a rational number terminates in 0s or eventually repeats. NJSLS.MATH.CONTENT.7.NS.A.3 Solve real-world and mathematical problems involving the four operations with rational numbers.	
Enduring Understandings	**Essential Questions**
1. Numbers can be represented in multiple ways. 2. The same operations can be applied in problem situations that seem quite different from another. 3. Being able to compute fluently means making smart choices about which tools to use and when to use them. 4. Knowing the reasonableness of an answer comes from using good number sense and estimation strategies.	1. What makes an estimate reasonable? 2. What makes an answer exact? 3. What makes a strategy both effective and efficient? 4. What makes a solution optimal?
Learners will know…	**Learners will be able to….**
● Addition and subtraction can be represented on a horizontal or vertical number line diagram. ● Opposite quantities combine to make 0 in specific situations. ● p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. ● A number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. ● Subtraction of rational numbers is done by adding the additive inverse, p - q = p + (-q). Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. ● Properties of operations are strategies applied to add and subtract rational numbers.	● Apply and extend previous understandings of addition and subtraction to add and subtract rational numbers. ● Represent addition and subtraction on a horizontal or vertical number line diagram. o Describe situations in which opposite quantities combine to make 0. o Understand p + q as the number located a distance |q| from p, in the positive or negative direction depending on whether q is positive or negative. o Show that a number and its opposite have a sum of 0 (are additive inverses). Interpret sums of rational numbers by describing real-world contexts. o Understand subtraction of rational numbers as adding the additive inverse, p - q = p + (-q).

● Multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. ● Integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. ● Long division is used to convert a rational number to a decimal. ● The decimal form of a rational number terminates in 0s or eventually repeats. ● Rational numbers are used to solve real-world and mathematical problems involving the four operations.	Show that the distance between two rational numbers on the number line is the absolute value of their difference, and apply this principle in real-world contexts. o Apply properties of operations as strategies to add and subtract rational numbers. ● Apply and extend previous understandings of multiplication and division and of fractions to multiply and divide rational numbers. o Understand that multiplication is extended from fractions to rational numbers by requiring that operations continue to satisfy the properties of operations, particularly the distributive property, leading to products such as (-1)(-1) = 1 and the rules for multiplying signed numbers. Interpret products of rational numbers by describing real-world contexts. o Understand that integers can be divided, provided that the divisor is not zero, and every quotient of integers (with non-zero divisor) is a rational number. If p and q are integers, then -(p/q) = (-p)/q = p/(-q). o Interpret quotients of rational numbers by describing real-world contexts. o Apply properties of

	operations as strategies to multiply and divide rational numbers. o Convert a rational number to a decimal using long division. o Know that the decimal form of a rational number terminates in 0s or eventually repeats. ● Solve real-world and mathematical problems involving the four operations with rational numbers.

Assessment/Evaluation Evidence

Formative Assessments
Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
Thumbs Up
Exit Slips
Think Pair Share
Group Reporters
Learning Logs
Math Journals
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Summative Assessments
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Benchmark Assessments

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Alternative Assessments

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Mathematics will be taught for 90 minutes per day with a format that resembles:

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    - Partner practice and discovery.
- Examples and Try It
    - Guided practice
    - Student conferences
    - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

- Big Ideas Math Modeling Real Life - Teacher Resources
-
- https://www.bigideasmath.com/BIM/login
-
- Big Ideas Math Manipulative Kit
- Student Edition
- Teaching Edition
- Family Letters
- Warm-Ups
- Extra Practice
- Reteach

- Enrichment and Extension
- Puzzle Time
- Prerequisite Skills Practice
- Pre and Post Course Assessments
- Course Benchmark Assessments
- Alternative Assessments
- Chapter Assessments
- STEAM Performance Tasks
- Activities
- Blackline Masters
- Virtual Manipulatives
- Interactive Explorations
- Digit Examples
- Skills Trainer
- Mini-Assessments
- STEAM videos
- Game Library
- Multi-language glossary
- Cross-Curricular Projects
- Graphic organizers
- Math Tool Paper
- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities

What does a Mathematician Look Like?

21st Century Life and Careers

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CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.
9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a

career

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9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

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- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

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specific word choices shape meaning or tone.

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Science Connection

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability]

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave

Integration of Technology (*How will students integrate technology throughout the unit? How will students achieve the NJSLS)*

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1Mscilw5gc1yf8yIddRhoUu24joEX5QOsqcPykbJanTA/edit?usp=sharing

Deal School Curriculum
Grade 7 Mathematics – Statistics and Probability

Desired Outcomes

Use random sampling to draw inferences about a population.

NJSLS.MATH.CONTENT.7.SP.A.1

Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. Understand that random sampling tends to produce representative samples and support valid inferences.

NJSLS.MATH.CONTENT.7.SP.A.2

Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. For example, estimate the mean word length in a book by randomly sampling words from the book; predict the winner of a school election based on randomly sampled survey data. Gauge how far off the estimate or prediction might be.

Draw informal comparative inferences about two populations.

NJSLS.MATH.CONTENT.7.SP.B.3

Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. For example, the mean height of players on the basketball team is 10 cm greater than the mean height of players on the soccer team, about twice the variability (mean absolute deviation) on either team; on a dot plot, the separation between the two distributions of heights is noticeable.

NJSLS.MATH.CONTENT.7.SP.B.4

Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. For example, decide whether the words in a chapter of a seventh-grade science book are generally longer than the words in a chapter of a fourth-grade science book.

Investigate chance processes and develop, use, and evaluate probability models.

NJSLS.MATH.CONTENT.7.SP.C.5

Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

NJSLS.MATH.CONTENT.7.SP.C.6

Approximate the probability of a chance event by collecting data on the chance

process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.
NJSLS.MATH.CONTENT.7.SP.C.7
Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.
NJSLS.MATH.CONTENT.7.SP.C.7.A
Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. For example, if a student is selected at random from a class, find the probability that Jane will be selected and the probability that a girl will be selected.
NJSLS.MATH.CONTENT.7.SP.C.7.B
Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. For example, find the approximate probability that a spinning penny will land heads up or that a tossed paper cup will land open-end down. Do the outcomes for the spinning penny appear to be equally likely based on the observed frequencies?
NJSLS.MATH.CONTENT.7.SP.C.8
Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation.
NJSLS.MATH.CONTENT.7.SP.C.8.A
Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs.
NJSLS.MATH.CONTENT.7.SP.C.8.B
Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space, which compose the event.
NJSLS.MATH.CONTENT.7.SP.C.8.C
Design and use a simulation to generate frequencies for compound events. For example, use random digits as a simulation tool to approximate the answer to the question: If 40% of donors have type A blood, what is the probability that it will take at least 4 donors to find one with type A blood?

Enduring Understandings	**Essential Questions**
1. The question to be answered determines the data to be collected and how best to collect it. 2. Basic statistical techniques can be used to analyze data in the workplace.	1. What is average? 2. What makes a data representation useful? 3. How does my sample affect confidence in my predication? 4. What is fair?

3. The probability of an event can be used to predict the probability of future events.	
Learners will know…	**Learners will be able to….**
● Random samplings are used to draw inferences about a population. ● Statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. ● Random sampling tends to produce representative samples and support valid inferences. ● Data from a random sample can be used to draw inferences about a population with an unknown characteristic of interest. ● Generating multiple samples (or simulated samples) of the same size is used to gauge the variation in estimates or predictions. ● Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, by measuring the difference between the centers by expressing it as a multiple of a measure of variability. ● Measures of center and measures of variability are used for numerical data from random samples to draw informal comparative inferences about two populations. ● The probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an	● Understand that statistics can be used to gain information about a population by examining a sample of the population; generalizations about a population from a sample are valid only if the sample is representative of that population. ● Understand that random sampling tends to produce representative samples and support valid inferences. ● Use data from a random sample to draw inferences about a population with an unknown characteristic of interest. ● Generate multiple samples (or simulated samples) of the same size to gauge the variation in estimates or predictions. ● Informally assess the degree of visual overlap of two numerical data distributions with similar variabilities, measuring the difference between the centers by expressing it as a multiple of a measure of variability. ● Use measures of center and measures of variability for numerical data from random samples to draw informal comparative inferences about two populations. ● Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an

unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. ● The probability of a chance event is approximated by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. ● A probability model is developed and used to find probabilities of events and compare them. ● A uniform probability model is developed by assigning equal probability to all outcomes, and uses the model to determine probabilities of events. ● The probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. ● Sample spaces for compound events are represented using methods such as organized lists, tables and tree diagrams. ● A simulation is designed and used to generate frequencies for compound events.	unlikely event, a probability around 1/2 indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event. ● Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. ● Develop a probability model and use it to find probabilities of events. ● Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. ● Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. ● Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. ● Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. ● Design and use a simulation to generate frequencies for compound events.

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LGBTQ+ and Disabilities
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21st Century Life and Careers

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CRP4. Communicate clearly and effectively and with reason.
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9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
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9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented
- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners
- Pair visual prompts with verbal presentations

- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

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Integration of Technology
8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results 8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities
Pacing Guide
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Deal School Curriculum
Grade 7 Mathematics – Geometry

Desired Outcomes

Draw construct, and describe geometrical figures and describe the relationships between them.

NJSLS.MATH.CONTENT.7.G.A.1

Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale.

NJSLS.MATH.CONTENT.7.G.A.2

Draw (with technology,, with ruler and protractor,as well as freehand) geometric shapes with given conditions. Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle.

NJSLS.MATH.CONTENT.7.G.A.3

Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids.

Solve real-life and mathematical problems involving angle measure, area, surface area, and volume.

NJSLS.MATH.CONTENT.7.G.B.4

Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle.

NJSLS.MATH.CONTENT.7.G.B.5

Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure.

NJSLS.MATH.CONTENT.7.G.B.6

Solve real-world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles, quadrilaterals, polygons, cubes, and right prisms.

Enduring Understandings	Essential Questions
- and three-dimensional objects can be described, classified, and analyzed by their attributes. bject in a plane or in space can be oriented in an infinite number of ways while maintaining its size or shape. bject's location on a plane or in space can be described quantitatively.	1. Why do we compare contrast and classify objects? 2. How do decomposing and recomposing shapes help us build our understanding of mathematics? 3. How can transformations be described mathematically?

ear measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other	
Learners will know…	**Learners will be able to….**
● There are strategies to solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. ● Geometric shapes are drawn with given conditions. ● Triangles may be constructed from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. ● Two-dimensional figures result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. ● Grade 7 students know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. ● Facts about supplementary, complementary, vertical, and adjacent angles can be used in a multi-step problem to write and solve simple equations for an unknown angle in a figure. ● Grade 7 students solve real world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles,	● Solve problems involving scale drawings of geometric figures, including computing actual lengths and areas from a scale drawing and reproducing a scale drawing at a different scale. ● Draw (freehand, with ruler and protractor, and with technology) geometric shapes with given conditions. ● Focus on constructing triangles from three measures of angles or sides, noticing when the conditions determine a unique triangle, more than one triangle, or no triangle. ● Describe the two-dimensional figures that result from slicing three-dimensional figures, as in plane sections of right rectangular prisms and right rectangular pyramids. ● Know the formulas for the area and circumference of a circle and use them to solve problems; give an informal derivation of the relationship between the circumference and area of a circle. ● Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. ● Solve real world and mathematical problems involving area, volume and surface area of two- and three-dimensional objects composed of triangles,

quadrilaterals, polygons, cubes, and right prisms..	quadrilaterals, polygons, cubes, and right prisms.

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Inclusive House Scale Drawing

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8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

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Pacing Guide

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Deal School Curriculum

Grade 7 Mathematics – Ratios & Proportional Relationships

Desired Outcomes

Analyze proportional relationships and use them to solve real-world and mathematical problems.

NJSLS.MATH.CONTENT.7.RP.A.1

Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. For example, if a person walks 1/2 mile in each 1/4 hour, compute the unit rate as the complex fraction 1/2/1/4 miles per hour, equivalently 2 miles per hour.

NJSLS.MATH.CONTENT.7.RP.A.2

Recognize and represent proportional relationships between quantities.

NJSLS.MATH.CONTENT.7.RP.A.2.A

Decide whether two quantities are in a proportional relationship, e.g., by testing for equivalent ratios in a table or graphing on a coordinate plane and observing whether the graph is a straight line through the origin.

NJSLS.MATH.CONTENT.7.RP.A.2.B

Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships.

NJSLS.MATH.CONTENT.7.RP.A.2.C

Represent proportional relationships by equations. For example, if total cost t is proportional to the number n of items purchased at a constant price p, the relationship between the total cost and the number of items can be expressed as t = pn.

NJSLS.MATH.CONTENT.7.RP.A.2.D

Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate.

NJSLS.MATH.CONTENT.7.RP.A.3

Use proportional relationships to solve multistep ratio and percent problems. Examples: simple interest, tax, markups and markdowns, gratuities and commissions, fees, percent increase and decrease, percent error.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions?

3. An operation can be "undone" by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured are computed in like or different units. ● Proportional relationships are recognized and represented between quantities. ● Proportional relationships are used to solve multistep ratio and percent problems.	● Compute unit rates associated with ratios of fractions, including ratios of lengths, areas and other quantities measured in like or different units. ● Recognize and represent proportional relationships between quantities. o Decide whether two quantities are in a proportional relationship. o Identify the constant of proportionality (unit rate) in tables, graphs, equations, diagrams, and verbal descriptions of proportional relationships. o Represent proportional relationships by equations. o Explain what a point (x, y) on the graph of a proportional relationship means in terms of the situation, with special attention to the points (0, 0) and (1, r) where r is the unit rate. ● Use proportional relationships to solve multistep ratio and percent problems.
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21st Century Life and Careers

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Deal School Curriculum
Grade 7 Mathematics – Expressions and Equations

Desired Outcomes

Use properties of operations to generate equivalent expressions.

NJSLS.MATH.CONTENT.7.EE.A.1

Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients.

NJSLS.MATH.CONTENT.7.EE.A.2

Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. For example, a + 0.05a = 1.05a means that "increase by 5%" is the same as "multiply by 1.05."

Solve real-life and mathematical problems using numerical and algebraic expressions and equations.

NJSLS.MATH.CONTENT.7.EE.B.3

Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. For example: If a woman making $25 an hour gets a 10% raise, she will make an additional 1/10 of her salary an hour, or $2.50, for a new salary of $27.50. If you want to place a towel bar 9 3/4 inches long in the center of a door that is 27 1/2 inches wide, you will need to place the bar about 9 inches from each edge; this estimate can be used as a check on the exact computation.

NJSLS.MATH.CONTENT.7.EE.B.4

Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.

NJSLS.MATH.CONTENT.7.EE.B.4.A

Solve word problems leading to equations of the form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. Solve equations of these forms fluently. Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. For example, the perimeter of a rectangle is 54 cm. Its length is 6 cm. What is its width?

NJSLS.MATH.CONTENT.7.EE.B.4.B

Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. For example: As a salesperson, you are paid $50 per week plus $3 per sale. This week you want your pay to be at least $100. Write an inequality for the number of sales you need to make, and describe the solutions.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be "undone" by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Properties of operations are applied as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ● Rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. ● Using tools strategically helps solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form. ● Properties of operations are used to calculate numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ● Variables are used to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities.	● Apply properties of operations as strategies to add, subtract, factor, and expand linear expressions with rational coefficients. ● Understand that rewriting an expression in different forms in a problem context can shed light on the problem and how the quantities in it are related. ● Solve multi-step real-life and mathematical problems posed with positive and negative rational numbers in any form (whole numbers, fractions, and decimals), using tools strategically. ● Apply properties of operations to calculate with numbers in any form; convert between forms as appropriate; and assess the reasonableness of answers using mental computation and estimation strategies. ● Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. o Solve word problems leading to equations of the

	form $px + q = r$ and $p(x + q) = r$, where p, q, and r are specific rational numbers. o Solve equations of these forms fluently. o Compare an algebraic solution to an arithmetic solution, identifying the sequence of the operations used in each approach. o Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. o Graph the solution set of the inequality and interpret it in the context of the problem.

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Alternative Assessments

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- Examples and Try It
  - Guided practice
  - Student conferences
  - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

District	Other
Big Ideas Math Modeling Real Life - Teacher Resources https://www.bigideasmath.com/BIM/login	**LGBTQ+ and Disabilities** What does a Mathematician Look Like?

Big Ideas Math Manipulative Kit Student Edition Teaching Edition Family Letters Warm-Ups Extra Practice Reteach Enrichment and Extension Puzzle Time Prerequisite Skills Practice Pre and Post Course Assessments Course Benchmark Assessments Alternative Assessments Chapter Assessments STEAM Performance Tasks Activities Blackline Masters Virtual Manipulatives Interactive Explorations Digit Examples Skills Trainer Mini-Assessments STEAM videos Game Library Multi-language glossary Cross-Curricular Projects Graphic organizers Math Tool Paper Dry Erase Boards Smart Notebook	

21st Century Skills

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
CRP2. Apply appropriate academic and technical skills.
CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

Personal Financial Literacy

9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.

9.1.8.D.1 Determine how saving contributes to financial well-being.

Career Awareness Exploration and Preparation

9.2.8.B.3 Evaluate communication, collaboration, and leadership skills that can be developed through school, home, work, and extracurricular activities for use in a career

Career and Technical Education

9.3.12.BM.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision-making in business.

9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented

- Provide appropriate challenge for wide ranging skills and development areas.
- Participate in inquiry and project-based learning units of study.

English Language Learners

- Pair visual prompts with verbal presentations
- Provide students with visual models, sentence stems, concrete objects, and hands on materials.

Students with IEPs/504

- Review student individual educational plan and/or 504 plan
- Establish procedures for accommodations and modifications for assessments as per IEP/504
- Modify classroom environment to support academic and physical needs of the students as per IEP/504

At Risk Learners:

- Provide Title 1 services to students not meeting academic standards in ELA and/or Math
- Differentiated instruction
- Basic Skills
- Provide instructional interventions in the general education classroom

Interdisciplinary Connections/Cross Curricular Opportunities

<u>Literacy Connection</u>

NJSLSA.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

NJSLSA.R1. Read closely to determine what the text says explicitly and to make

logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

NJSLSA.R4. Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

NJSLSA.R7. Integrate and evaluate content presented in diverse media and formats, including visually and quantitatively, as well as in words.

Science Connection

MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

MS-LS4-6. Use mathematical representations to support explanations of how natural selection may lead to increases and decreases of specific traits in populations over time. [Clarification Statement: Emphasis is on using mathematical models, probability]

MS-PS4-1. Use mathematical representations to describe a simple model for waves that includes how the amplitude of a wave is related to the energy in a wave

Integration of Technology

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/1Mscilw5gc1yf8yIddRhoUu24joEX5QOsqcPykbJanTA/edit?usp=sharing

Annual Pacing Guide

Grade Level: 7

Subject: Math

September	October	November	December	January
lding and Subtracting tional Numbers	Multiplying and Dividing Rational Numbers	Expressions	Equations and Inequalities	Ratios and Proportions

February	March	April	May	June
rcent	Probability	Statistics	Geometry	Surface Area and Volume

Working document.

Update as needed

Deal School Curriculum

Mathematics
Curriculum Guide
Grade 8

Deal School

Deal, New Jersey

2018
Board of Education

Dennis Melofchik, President
Kaye Jannarone, Vice President

Michael Sorrentino
Donna Rienzo
David Tawil

Administration

Donato Saponaro, Jr.
Superintendent of Schools

Curriculum Writing Committee

Administration

Donato Saponaro, Jr.

Consultant/Curriculum Development

Nick Montesano

Teacher(s)

Christina Robbins
Bill Martin

Developed and Written

August – November 2014

Revised

December 2018

Board Approved

December 2018

Course Introduction

The *Digits Math* program fully aligns with the national Common Core State Standards for Grade 8 Mathematics. The program is distinguished by its focus on real-life problem solving, balance between whole-class and self-directed learning, emphasis on communication, facilitation of school-family cooperation, and appropriate use of technology.

The projects, class games, and computer games are designed for students to revisit skills learned and apply what they learned to real life situations.

Purpose

Our purpose is to have all of our students acquire the mathematical skills, understandings, and attitudes that they will need to be successful in their careers and daily lives.

Assessments

Throughout the course students will demonstrate their knowledge daily during mental math and math message activities. Students will be assessed on daily quick checks, unit projects, written and self-assessments and open-ended response problems.
#

Deal School Curriculum
Grade 8 Mathematics – The Number System

Desired Outcomes

Know that there are numbers that are not rational, and approximate them by rational numbers.

NJSLS.MATH.CONTENT.8.NS.A.1

Know that numbers that are not rational are called irrational. Understand informally that every number has a decimal expansion; for rational numbers show that the decimal expansion repeats eventually, and convert a decimal expansion, which repeats eventually into a rational number.

NJSLS.MATH.CONTENT.8.NS.A.2

Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi 2$). For example, by truncating the decimal expansion of $\sqrt{2}$, show that $\sqrt{2}$ is between 1 and 2, then between 1.4 and 1.5, and explain how to continue on to get better approximations.

Enduring Understandings	**Essential Questions**
1. Numbers can be represented in multiple ways. 2. The same operations can be applied in problem situations that seem quite different from another. 3. Being able to compute fluently means making smart choices about which tools to use and when to use them. 4. Knowing the reasonableness of an answer comes from using good number sense and estimation strategies.	1. What makes an estimate reasonable? 2. What makes an answer exact? 3. What makes a strategy both effective and efficient? 4. What makes a solution optimal?
Learners will know…	**Learners will be able to….**
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numbers, locate them approximately on a number line diagram, and estimate the value of expressions.	• Use rational approximations of irrational numbers to compare the size of irrational numbers, locate them approximately on a number line diagram, and estimate the value of expressions (e.g., $\pi 2$).

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Assessments: Concept testing and performance tasks.

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- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities

- What does a Mathematician look like?

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
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Personal Financial Literacy

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9.3.12.FN.1 Utilize mathematical concepts, skills and problem solving to obtain necessary information for decision making in the finance industry.

Accommodations and Modifications

Gifted and Talented
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English Language Learners
- Pair visual prompts with verbal presentations
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Literacy Connection

NJSLSA.6.2. Determine a central idea of a text and how it is conveyed through particular details; provide a summary of the text distinct from personal opinions or judgments.

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MS-ESS1-3. Analyze and interpret data to determine scale properties of objects in the solar system.

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8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

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Deal School Curriculum
Grade 8 Mathematics – The Number System

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Deal School Curriculum
Grade 8 Mathematics – Statistics and Probability

Desired Outcomes

Investigate patterns of association in bivariate data.

NJSLS.MATH.CONTENT.8.SP.A.1

Construct and interpret scatter plots for bivariate measurement data to investigate patterns of association between two quantities. Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association.

NJSLS.MATH.CONTENT.8.SP.A.2

Know that straight lines are widely used to model relationships between two quantitative variables. For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line.

NJSLS.MATH.CONTENT.8.SP.A.3

Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. For example, in a linear model for a biology experiment, interpret a slope of 1.5 cm/hr as meaning that an additional hour of sunlight each day is associated with an additional 1.5 cm in mature plant height.

NJSLS.MATH.CONTENT.8.SP.A.4

Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. Use relative frequencies calculated for rows or columns to describe possible association between the two variables. For example, collect data from students in your class on whether or not they have a curfew on school nights and whether or not they have assigned chores at home. Is there evidence that those who have a curfew also tend to have chores?

Enduring Understandings	**Essential Questions**
1. The question to be answered determines the data to be collected and how best to collect it. 2. Basic statistical techniques can be used to analyze data in the workplace. 3. The probability of an event can be used to predict the probability of future events.	1. What is average? 2. What makes a data representation useful? 3. How does my sample affect confidence in my predication? 4. What is fair?
Learners will know…	**Learners will be able to….**
● Scatter plots for bivariate measurement data are	● Construct and interpret scatter plots for bivariate measurement

constructed and interpreted to investigate patterns of association between two quantities. ● Patterns may be described as clustering, outliers, positive or negative association, linear association, and nonlinear association. ● Straight lines are widely used to model relationships between two quantitative variables. ● For scatter plots that suggest a linear association, it is possible to informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. ● The equation of a linear model is used to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. ● Patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. ● Relative frequencies calculated for rows or columns are used to describe possible association between the two variables.	data to investigate patterns of association between two quantities. ● Describe patterns such as clustering, outliers, positive or negative association, linear association, and nonlinear association. ● Know that straight lines are widely used to model relationships between two quantitative variables. ● For scatter plots that suggest a linear association, informally fit a straight line, and informally assess the model fit by judging the closeness of the data points to the line. ● Use the equation of a linear model to solve problems in the context of bivariate measurement data, interpreting the slope and intercept. ● Understand that patterns of association can also be seen in bivariate categorical data by displaying frequencies and relative frequencies in a two-way table. ● Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects. ● Use relative frequencies calculated for rows or columns to describe possible association between the two variables.

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LGBTQ+ and Disabilities

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- Analyzing Inclusive Data

21st Century Life and Careers

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9.1.8.A.2 Relate how career choices, education choices, skills, entrepreneurship, and economic conditions affect income.
9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.
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Deal School Curriculum
Grade 8 Mathematics – Geometry

Desired Outcomes

Understand congruence and similarity using physical models, transparencies, or geometry software.

NJSLS.MATH.CONTENT.8.G.A.1

Verify experimentally the properties of rotations, reflections, and translations:

a.Lines are transformed to line segments to line segments of the same length.

b.Angles are transformed to angles of the same measure.

c.Parallel lines are transformed to parallel lines.

NJSLS.MATH.CONTENT.8.G.A.2

Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them.

NJSLS.MATH.CONTENT.8.G.A.3

Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates.

NJSLS.MATH.CONTENT.8.G.A.4

Understand that a two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them.

NJSLS.MATH.CONTENT.8.G.A.5

Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. For example, arrange three copies of the same triangle so that the sum of the three angles appears to form a line, and give an argument in terms of transversals why this is so.

Understand and apply the Pythagorean Theorem.

NJSLS.MATH.CONTENT.8.G.B.6

Explain a proof of the Pythagorean Theorem and its converse.

NJSLS.MATH.CONTENT.8.G.B.7

Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions.

NJSLS.MATH.CONTENT.8.G.B.8

Apply the Pythagorean Theorem to find the distance between two points in a coordinate system.

Solve real-world and mathematical problems involving volume of cylinders, cones, and spheres. NJSLS.MATH.CONTENT.8.G.C.9 Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.	
Enduring Understandings	**Essential Questions**
ɔ- and three-dimensional objects can be described, classified, and analyzed by their attributes. ɔbject in a plane or in space can be oriented in an infinite number of ways while maintaining its size or shape. ɔbject's location on a plane or in space can be described quantitatively. ɛar measure, area, and volume are fundamentally different but may be related to one another in ways that permit calculation of one given the other	1. Why do we compare contrast and classify objects? 2. How do decomposing and recomposing shapes help us build our understanding of mathematics? 3. How can transformations be described mathematically?
Learners will know…	**Learners will be able to….**
● Lines are taken to lines, and line segments to line segments of the same length. ● Angles are taken to angles of the same measure. ● Parallel lines are taken to parallel lines. ● A two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. ● Dilations, translations, rotations, and reflections effect two-dimensional figures in different ways and can by described using coordinates. ● A two-dimensional figure is similar to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations.	● Verify experimentally the properties of rotations, reflections, and translations: o Lines are taken to lines, and line segments to line segments of the same length. o Angles are taken to angles of the same measure. o Parallel lines are taken to parallel lines. ● Understand that a two-dimensional figure is congruent to another if the second can be obtained from the first by a sequence of rotations, reflections, and translations; given two congruent figures, describe a sequence that exhibits the congruence between them. ● Describe the effect of dilations, translations, rotations, and reflections on two-dimensional figures using coordinates. ● Understand that a two-dimensional figure is similar

● Informal arguments are used to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. ● The Pythagorean theorem may be applied to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. ● The Pythagorean theorem may be applied to find the distance between two points in a coordinate system. ● Formulas for the volumes of cones, cylinders, and spheres are used to solve real-world and mathematical problems.	to another if the second can be obtained from the first by a sequence of rotations, reflections, translations, and dilations; ● Given two similar two-dimensional figures, describe a sequence that exhibits the similarity between them. ● Use informal arguments to establish facts about the angle sum and exterior angle of triangles, about the angles created when parallel lines are cut by a transversal, and the angle-angle criterion for similarity of triangles. ● Explain a proof of the Pythagorean theorem and its converse. ● Apply the Pythagorean Theorem to determine unknown side lengths in right triangles in real-world and mathematical problems in two and three dimensions. ● Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. ● Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

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Deal School Curriculum
Grade 8 Mathematics – Functions

Desired Outcomes

Define, evaluate, and compare functions.

NJSLS.MATH.CONTENT.8.F.A.1

Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1

NJSLS.MATH.CONTENT.8.F.A.2

Compare properties (e.g.,rate of change,intercepts,domain and range) of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions). For example, given a linear function represented by a table of values and a linear function represented by an algebraic expression, determine which function has the greater rate of change.

NJSLS.MATH.CONTENT.8.F.A.3

Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. For example, the function A = s2 giving the area of a square as a function of its side length is not linear because its graph contains the points (1,1), (2,4) and (3,9), which are not on a straight line.

Use functions to model relationships between quantities.

NJSLS.MATH.CONTENT.8.F.B.4

Construct a function to model a linear relationship between two quantities. Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values.

NJSLS.MATH.CONTENT.8.F.B.5

Describe qualitatively the functional relationship between two quantities by analyzing a graph (e.g., where the function is increasing or decreasing, linear or nonlinear). Sketch a graph that exhibits the qualitative features of a function that has been described verb**ally.**

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be “undone” by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?

equivalence to transform equations and inequalities so solutions can be found.	
Learners will know…	**Learners will be able to….**
● A function is a rule that assigns to each input exactly one output. ● The graph of a function is the set of ordered pairs consisting of an input and the corresponding output. ● Two functions may each be represented in a different way. ● The equation y = mx + b is interpreted as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. ● A function may be constructed to model a linear relationship between two quantities. ● The rate of change and initial value of the function is determined from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. ● The rate of change and initial value of a linear function is interpreted in terms of the situation it models, and in terms of its graph or a table of values. ● The functional relationship between two quantities can be described qualitatively by analyzing a graph.	● Understand that a function is a rule that assigns to each input exactly one output. The graph of a function is the set of ordered pairs consisting of an input and the corresponding output.1 ● Compare properties of two functions each represented in a different way. ● Interpret the equation y = mx + b as defining a linear function, whose graph is a straight line; give examples of functions that are not linear. ● Construct a function to model a linear relationship between two quantities. ● Determine the rate of change and initial value of the function from a description of a relationship or from two (x, y) values, including reading these from a table or from a graph. ● Interpret the rate of change and initial value of a linear function in terms of the situation it models, and in terms of its graph or a table of values. ● Describe qualitatively the functional relationship between two quantities by analyzing a graph. ● Sketch a graph that exhibits the qualitative features of a function that has been described verb**ally.**
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Deal School Curriculum
Grade 8 Mathematics – Expressions and Equations

Desired Outcomes

Expressions and Equations Work with radicals and integer exponents.

NJSLS.MATH.CONTENT.8.EE.A.1

Know and apply the properties of integer exponents to generate equivalent numerical expressions. For example, 32 × 3-5 = 3-3 = 1/33 = 1/27.

NJSLS.MATH.CONTENT.8.EE.A.2

Use square root and cube root symbols to represent solutions to equations of the form x2 = p and x3 = p, where p is a positive rational number. Evaluate square roots of small perfect squares and cube roots of small perfect cubes. Know that √2 is irrational.

NJSLS.MATH.CONTENT.8.EE.A.3

Use numbers expressed in the form of a single digit times an integer power of 10 to estimate very large or very small quantities, and to express how many times as much one is than the other. For example, estimate the population of the United States as 3 times 108 and the population of the world as 7 times 109, and determine that the world population is more than 20 times larger.

NJSLS.MATH.CONTENT.8.EE.A.4

Perform operations with numbers expressed in scientific notation, including problems where both decimal and scientific notation are used. Use scientific notation and choose units of appropriate size for measurements of very large or very small quantities (e.g., use millimeters per year for seafloor spreading). Interpret scientific notation that has been generated by technology

Understand the connections between proportional relationships, lines, and linear equations.

NJSLS.MATH.CONTENT.8.EE.B.5

Graph proportional relationships, interpreting the unit rate as the slope of the graph. Compare two different proportional relationships represented in different ways. For example, compare a distance-time graph to a distance-time equation to determine which of two moving objects has greater speed.

NJSLS.MATH.CONTENT.8.EE.B.6

Use similar triangles to explain why the slope m is the same between any two distinct points on a non-vertical line in the coordinate plane; derive the equation y = mx for a line through the origin and the equation y = mx + b for a line intercepting the vertical axis at b.

Analyze and solve linear equations and pairs of simultaneous linear equations.

NJSLS.MATH.CONTENT.8.EE.C.7

Solve linear equations in one variable.

NJSLS.MATH.CONTENT.8.EE.C.7.A

Give examples of linear equations in one variable with one solution, infinitely many

solutions, or no solutions. Show which of these possibilities is the case by successively transforming the given equation into simpler forms, until an equivalent equation of the form x = a, a = a, or a = b results (where a and b are different numbers).
NJSLS.MATH.CONTENT.8.EE.C.7.B
Solve linear equations with rational number coefficients, including equations whose solutions require expanding expressions using the distributive property and collecting like terms.
NJSLS.MATH.CONTENT.8.EE.C.8
Analyze and solve pairs of simultaneous linear equations.
NJSLS.MATH.CONTENT.8.EE.C.8.A
Understand that solutions to a system of two linear equations in two variables correspond to points of intersection of their graphs, because points of intersection satisfy both equations simultaneously.
NJSLS.MATH.CONTENT.8.EE.C.8.B
Solve systems of two linear equations in two variables algebraically, and estimate solutions by graphing the equations. Solve simple cases by inspection. For example, 3x + 2y = 5 and 3x + 2y = 6 have no solution because 3x + 2y cannot simultaneously be 5 and 6.
NJSLS.MATH.CONTENT.8.EE.C.8.C
Solve real-world and mathematical problems leading to two linear equations in two variables. For example, given coordinates for two pairs of points, determine whether the line through the first pair of points intersects the line through the second pair.

Enduring Understandings	**Essential Questions**
1. Change is fundamental to understanding functions. 2. Numbers or objects that repeat in predictable ways can be described or generalized. 3. An operation can be “undone” by its inverse. 4. Rules of arithmetic and algebra can be used together with notions of equivalence to transform equations and inequalities so solutions can be found.	1. How can change be described mathematically? 2. How are patterns of change related to the behavior of functions? 3. How do mathematical models/representations shape our understanding of mathematics?
Learners will know…	**Learners will be able to….**
● Bases must be the same before exponents can be added, subtracted or multiplied. ● Exponents are subtracted like bases are being divided. ● A number raised to the zero power is equal to one.	● Generate equivalent numerical expressions when multiplying, dividing, or raising a power to a power. ● Recognize perfect squares and cubes. ● Solve equations containing square or cube numbers.

• Negative exponents occur when there are more factors in the denominator. These exponents can be expressed as a positive if left in the denominator. • Exponents are added when like bases are being multiplied. • Exponents are multiplied when an exponent is raised to an exponent. • Several properties may be used to simplify an expression. • Squaring a number and taking the square root are inverse operations. • Non-perfect square and non-perfect cubes are irrational. • If the exponent increases by one, the value increases 10 times.	• Use scientific notation to express very large or very small numbers. • Solve problems using addition, subtraction or multiplication, expressing the answer in scientific notation.

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- Prerequisite Skills Practice
- Pre and Post Course Assessments
- Course Benchmark Assessments
- Alternative Assessments
- Chapter Assessments
- STEAM Performance Tasks
- Activities
- Blackline Masters
- Virtual Manipulatives
- Interactive Explorations
- Digit Examples
- Skills Trainer
- Mini-Assessments
- STEAM videos
- Game Library
- Multi-language glossary
- Cross-Curricular Projects
- Graphic organizers
- Math Tool Paper
- Dry Erase Boards
- Smart Notebook

LGBTQ+ and Disabilities

- What does a Mathematician look like?

21st Century Life and Careers

Career Ready Practices

CRP1. Act as a responsible and contributing citizen and employee.
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CRP4. Communicate clearly and effectively and with reason.
CRP8. Utilize critical thinking to make sense of problems and persevere in solving them

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9.1.8.B.7 Construct a budget to save for long-term, short-term, and charitable goals.

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logical inferences and relevant connections from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

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Integration of Technology

8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools

8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

8.1.P.C.1 Collaborate with peers by participating in interactive digital games or activities

Pacing Guide

https://docs.google.com/document/d/12hRsn4AiovofkYiH3xgVoyrN35_U4Q6zCsqXpXTD43c/edit?usp=sharing

Annual Pacing Guide

Grade Level: 8-pre-algebra

Subject: Math

September	October	November	December	January
uations	Transformations	Angles and Triangles	Graphing and Writing Linear Equation	Systems of Linear Equations

February	March	April	May	June
ta Analysis	Functions	Exponents and Scientific Notation	Real Numbers and the PYTHAGOREAN THEOREM	Volume and Similar Solids

Working document.

Update as needed

Deal School Curriculum
Grade 8 Mathematics - Algebra 1

Desired Outcomes

Solving Linear Equations and Inequalities

A.REI.B.3: Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

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 equations has a solution. Construct a viable argument to justify a solution method.

A.CED.A.4: Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V=IR to highlight resistance R.

A.CED.A.1: Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic function, and simple rational and exponential functions.

Introduction to Functions, Linear Functions, & Exponents and Exponential Functions

F-IF.A.1: 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).

F-IF.A.2: Use function notation, evaluate functions for inputs in their domains, and interpret statements that use function notation in terms of a context.

F-IF.A.3: Recognize that sequences are functions, sometimes defined recursively, whose domain is a subset of the integers.

F-IF.B.4: For a functions 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. *

F-IF.B.5: Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.*

F-IF.B.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.

Estimate the rate of change from a graph.
S-ID.C.7: Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.
N-RN.A.1: Explain how the definition of the meaning of rational exponents follows from extending the properties of integer's exponents to
those values, allowing for a notation for radicals in terms of rational exponents. For example, we define 51/3 to be the cube root of 5
because we want (51/3)3=5(1/3)3 to hold, so (51/3)3 must equal 5.19
A-CED.A.2: Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes
and labels and scales.
A-CED.A.3: Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as
viable or nonviable options in a modeling context.
Systems of equations, Polynomials & Factoring, Quadratic Functions & Equations, and Rational Expressions & Functions
A-REI.B.4a: 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. 28
A-REI.B.4b: Solve quadratics equations by inspection (e.g., for x2= 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 ± bi
for real numbers a and b.
A-REI.D.11: Explain why the x-coordinates of the points where the graphs of the equations 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.*
A-REI.D.12: Graph the solutions to a linear inequality in two variables as a half plane (excluding the boundary in the case of a strict inequality), and
graph the solution set to a system of linear inequalities in two variables as the intersection of the corresponding half-planes.
A-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.
A-SSE.A.1: Interpret expressions that represent a quantity in terms of its context.*
A.SSE.A.1a: Interpret parts of an expression, such as terms, factors, and coefficient.
A-SSE.A.2: Use the structure of an expression to identify ways to rewrite it.
A-SSE.B.3a: Factor a quadratic expression to reveal the zeros of the function it defines.
A-SSE.B.3b: Complete the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.
A-CED.A.1: Create equations and inequalities in one variable and use to solve

problems, Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

Radical Expressions and Equations plus Data Analysis and Probability

F-IF.B.4: For functions 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;37 intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F-IF.B.5: Relate the domain of a function to its graph and, where applicable, to the quantitative relationship it describes. For example, if the function h(n) gives the number of person-hours it takes to assemble n engines in a factory, then the positive integers would be an appropriate domain for the function.

F-IF.B.6: Calculate and interpret the average rate of change of a function (presented symbolically or as a table) over a specified interval.

Estimate the rate of change from a graph.

F.IF.C.7b: Graph square root, cube root, and piecewise-defined functions, including step functions and absolute value functions.

F-BF.A.1b: Combine standard function types using arithmetic operations.

F-BF.B.3: Identify the effect on the graph of replacing f(x) by f(x) + k, k f(x), f(kx), and f(x + k) for specific values of k (both positive and negative); find the value of k given the graphs. Experiment with cases and illustrate an explanation of the effects on the graph using technology. Include recognizing even and odd functions from their graphs and algebraic expressions for them.

F-BF.B.4: Find inverse functions.

F-BF.B.4a: 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.

S.ID.A.1: Represent data on the real number line (dot plots, histograms, and box plots).

S.ID.A.2: Use statistic 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.

S-ID.A.3: Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S-IC.B.5: Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

Enduring Understandings	**Essential Questions**
• Equation solving is working backward and using inverse operations. • Function notation provides	•How can you represent real-life situations into equations and inequalities?

instructions to be applied to mathematical expressions. • Solving inequalities is similar to solving equations, working backward and applying inverse operations, the exception being when multiplying or dividing by a negative number. • The solution to an inequality is a set of numbers, not just a single solution. • Absolute value is the distance from zero. • Systems of linear equations/inequalities can be used to model problems and can be solved by graphing, substituting, or eliminating a variable. • Functional relationships can be expressed in real contexts, graphs, algebraic equations, tables, and words; each representation if a given function is simply a different way of expressing the same idea. • A solution to a system of equations can be applied to man situations in the real world. • Algebraic and numeric procedures are interconnected and build on one another to produce a coherent whole. • Rules of arithmetic and algebra can be used to transform and manipulate equations and inequalities so solutions can be found to solve problems. • Quadratic equations can be solved by a variety of methods including graphing, taking square roots, factoring, or using the quadratic formula. • Quadratic functions can model real-world situations such as falling objects, vertical motion, and area. • Radical expressions with like-radicals can be added and subtracted . • Radical expressions must be in simplest form. • The graph of a square root function has unique characteristics.	• How do you solve equations using algebra and other strategies? • How can linear equations be used to model real world situations? • How can we use linear graphing in order to predict outcomes? • How is function notation used to model real world situations? • How do you solve inequalities using algebra and other strategies? • How can we model real world situations using absolute value? • How are functions and their graphs related? • How can patterns, relations, and functions be used as tools to best describe and help explain real world situations? • How can you solve system of linear equations? • How can you solve system of linear inequalities? • How can you model a real-world situation using a system of equations/inequalities and then solve the system and interpret the solution in the context of the problem? • What are the characteristics of quadratic functions? • How can we model real world situations using quadratics? • How are the properties of real numbers related to polynomials? • Can two algebraic expressions that appear to be different be equivalent? • What different methods can be used to solve quadratic equations? • How many solutions does a quadratic have? • How can you use the properties of real numbers to perform operations with radical expressions? • How do we know if a radical expression is in simplest form? • How can we compare situations using

• A quadratic equation can be solved by using a variety of techniques including using a graphing calculator. • The graph of a quadratic function results in a parabola. • The results of a statistical investigation can be used to support or refute an argument. •Data sets can be displayed and compared by using dot plots, scatter plots, box plots, histograms. • Mean, median, mode, IQR, range and standard deviation can used in interpreting and understanding data. • Radical expressions with like-radicals can be added and subtracted. • Radical expressions must be in simplest form. • Rationalize the denominator. • Use inverse operations in order to solve radical equations.	quadratic functions and linear functions? • How can we solve quadratic equations using the quadratic formula, factoring, or the graph of a parabola? • What is the best way to solve a quadratic equation? • How do quadratic functions relate to their graphs? • How can the collection, organization, interpretation, and display of data be used to answer questions? • How can statistical methods be used to find and interpret relationships between sets of data? • How can two-way tables of categorical data be used to recognize associations and trends between the two categories of categorical data? • How can data be displayed and compared, and what information can be gathered from the displays? • How do the results of a statistical investigation be used to support an argument? •How can you use the properties of real numbers to perform operations with radical expressions? • How do we know if a radical expression is in simplest form? • How are radicals and rational exponents related?
Learners will know…	**Learners will be able to….**
● The basic process/steps for simplifying expressions ● The process/steps for solving equations and inequalities ● The parts of a coordinate plane in order to graph inequalities (Ex: origin, x-axis, y-axis, etc...) ● The differences between rational & irrational numbers (advanced only) ● Similarities and differences between linear and nonlinear functions	● Write expressions using addition, subtraction, multiplication and division ● Simplify expressions using Order of Operations and the Distributive Property ● Solve multi-step equations ● 4. Solve word problems that involving rates, ratios, and convert units ● Solve and apply proportions to word problems ● Apply the use of proportions to

● How to graph a linear equation ● The slope-intercept and standard form formulas for linear equations ● Properties of exponents ● Describe what slope means and identify the four types of slope ● How to graph a linear inequality and equation ● The basic steps for factoring polynomials including binomials and trinomials ● Identify and apply the Quadratic formula ● Solving systems of equation by either one of the three methods will give you ● the same answer. ● The basic terms of probability ● The difference between quantitative and qualitative data ● The difference between a Permutation and Combination ● Basic operations with radicals(addition, subtraction, multiplication, & Division) ● Pythagorean Theorem ● How to solve equations and inequalities	solve for a missing side in similar figures ● Solve multi-step inequalities and graph ● Use graphs to relate two quantities ● To identify and represent patterns that describe linear & ● nonlinear functions ● Graph a function rule ● 5. Extend, identify, and write Arithmetic Sequences ● Find the rate of change ● Find the slope given a graph or two order pairs ● Write and graph an equation of direct variation ● Write linear equations using slope-intercept form & standard form ● Simplify expressions involving zero and negative exponents ● Properties of exponents: multiply powers with the same ● base, power to a power, product to a power, and dividing ● exponents ● Graph linear inequalities in two variables. ● Add, subtract, multiply and factor polynomials ● Multiply binomials ● Factor trinomials in the form x2+bx+c and ax2+bx+c ● Solving and factoring Quadratic equations ● Solve rational equations ● Graph rational functions ● Interpret categorical and Quantitative Data ● Make inferences and justify conclusions ● Conditional Probability and the Rules of Probability ● Display and analyze data in a

	matrix, frequency table, ● histogram, and box-and-whisker ● Solve equations with radicals ● Use trigonometric ratios to find a side length of a right triangle

Assessment/Evaluation Evidence

Formative Assessments

Homework
Checklist Assessments
Center Products
Writing Samples
Pre-Assessments
- Thumbs Up
- Exit Slips
- Think Pair Share
- Group Reporters
- Learning Logs
- Math Journals
- Turn and Talks

Student Self-Assessment
Graphic Organizers
Peer review
Class Discussion
Dry erase board assessment
Big Ideas Apply and Grow

Summative Assessments

Unit Assessments
Alternative Assessments
Quizzes
Project specific Rubrics
Group Project Products

Benchmark Assessments

Big-Ideas Pre-Assessment
Big Ideas Post-Assessment
Big Ideas Course Benchmarks
LinkIt! Benchmark A
LinkIt! Benchmark B
LinkIt! Benchmark C

Alternative Assessments

Project Specific Rubrics
Group Project Products

Suggested Learning Plan

Mathematics will be taught for 90 minutes per day with a format that resembles:

- Warm Up
- Exploration
    - Direct instruction and modeling.
    - Partner practice and discovery.
- Examples and Try It
    - Guided practice
    - Student conferences
    - Reteaching
- Self Assessment - Independent Practice
- Modeling Real Life
- Differentiated instruction and homework assignment.

Assessments: Concept testing and performance tasks.

Suggested Learning Resources

- Big Ideas Math Modeling Real Life - Teacher Resources
- https://www.bigideasmath.com/BIM/login
- Big Ideas Math Manipulative Kit
- Student Edition
- Teaching Edition
- Family Letters
- Warm-Ups
- Extra Practice
- Reteach
- Enrichment and Extension
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